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CAR AND DRIVER

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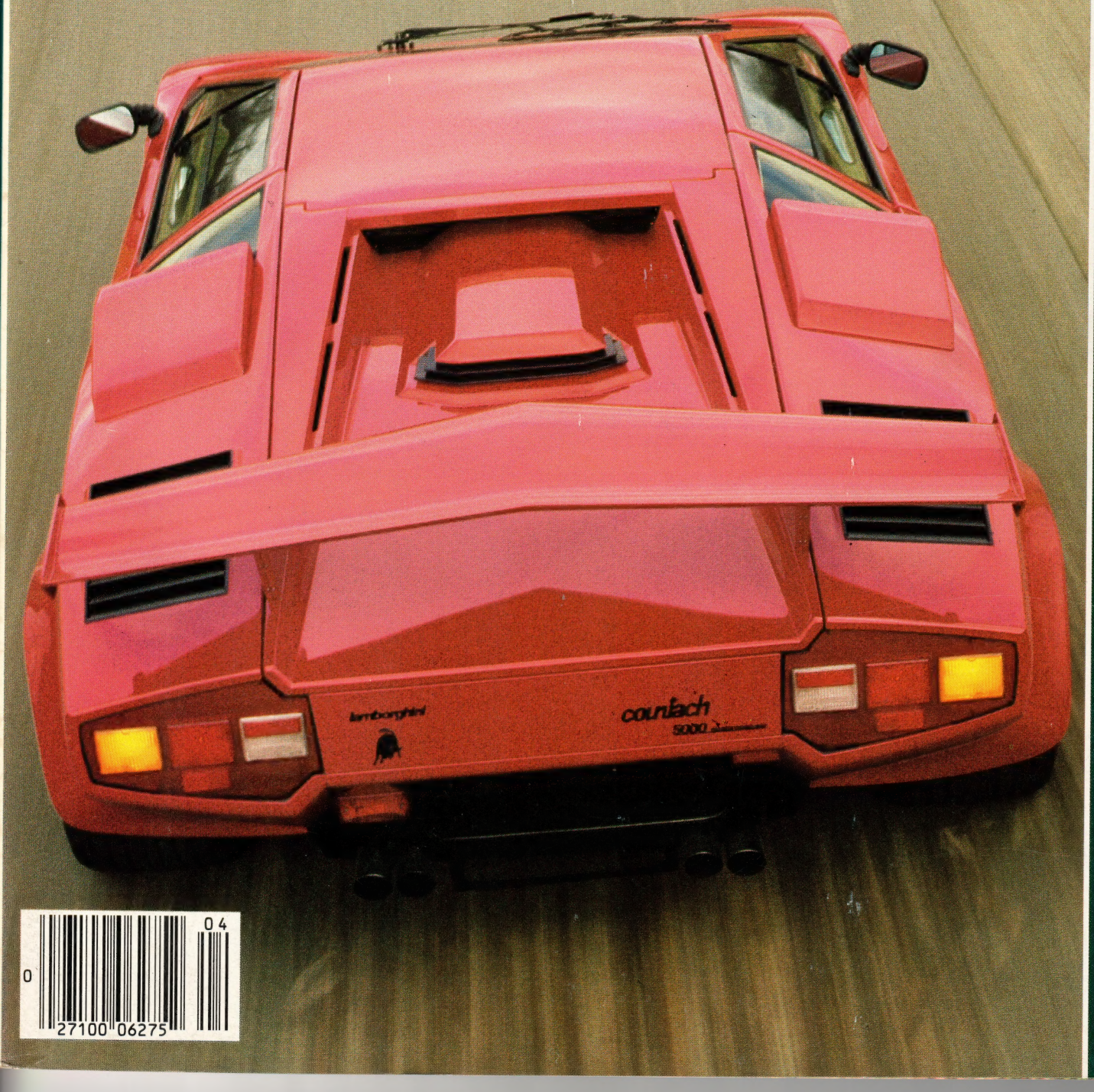
Countach Attack!

If Rambo were a car, he'd be this Lamborghini



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The Honda Civic Hatchback is a lot like everyone's ideal. It makes you happy, without making a lot of demands.

For instance, it doesn't demand a lot of your resources. It's the lowest-priced Honda. And one of the lowest-priced cars in America.

It doesn't demand much attention because it's engineered right. And thanks to the long roofline, this hatchback doesn't demand that backseat passengers sit hunched forward.

While you'll be smitten by its aerodynamic styling, you'll be impressed by its front-wheel drive, rack and pinion steering, steel-belted radials and opening rear quarter windows.

Best of all, because it's a Honda, it has that special quality which is, after all, why we fall for some and not others.

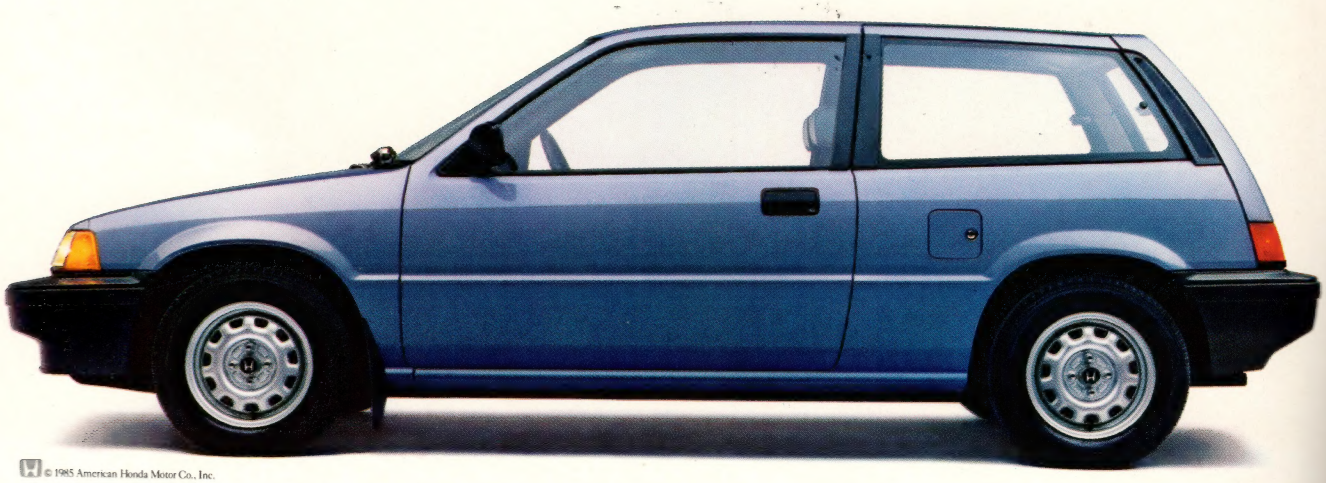
The Honda Civic Hatchback. At $5649,* falling in love doesn't have to hurt.

*Based on manufacturer's suggested retail price excluding freight, taxes, license, title, options and required equipment.

HONDA

The Civic Hatchback

Fall in love without paying the price.



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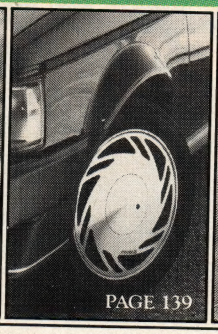
PAGE 47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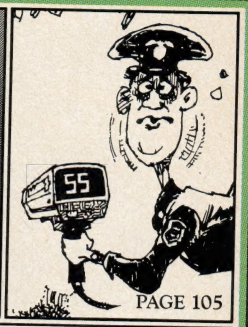

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ROAD TESTS

FEATURES

SHORT TAKES

COLUMNS

FOR YOUR INFORMATION

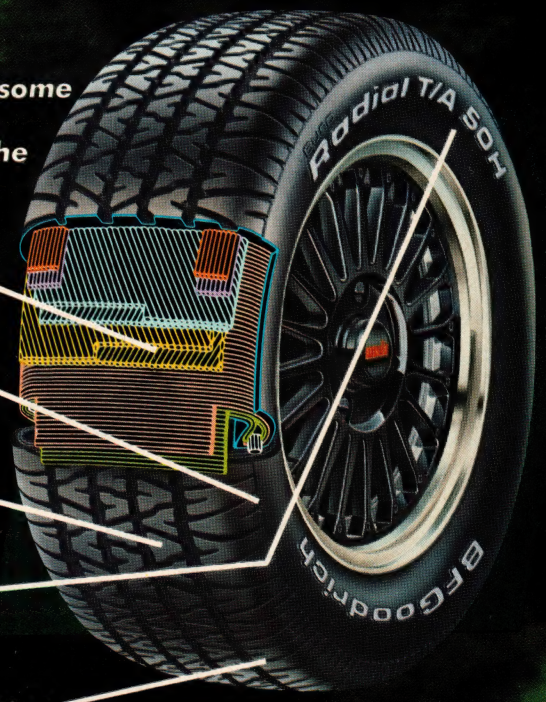
SPORT

Cover photography by Aaron Kiley

WHY YOU NEED A TO TAKE ON A

THE EURO T/A®

It's good to have performance in reserve on a straightaway. But on some roads, you need superior braking and cornering power. Here's why the Euro T/A® offers you handling to spare:



It is H speed-rated for travel up to 130mph—with cornering power to match—because of its advanced belt technology.

Tread design, sidewall, and advanced compound technology combine to give you quick steering response and crisp handling.

In the dry or the wet, enhanced compound technology and high void-to-rubber ratio help the Euro T/A grip the road with superior traction.

Reversible for your choice of contemporary blackwall or raised white letters, it is also available in 50, 60, 65, and 70-series sizes.

The Euro T/A is built with the same technology that offers you the Comp T/A,® at the top of the world's most complete line of high-performance radials.

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Small Wonder

It's here, *pocket-size* radar protection.

Imagine a superbly crafted electronic instrument, powerful enough to protect against traffic radar, miniaturized enough to slide into a shirt pocket, beautiful enough to win an international design award.

Small means nearly-invisible protection

That could only be PASSPORT. It has exactly what the discerning driver needs, superheterodyne performance in a package the size of a cassette tape.

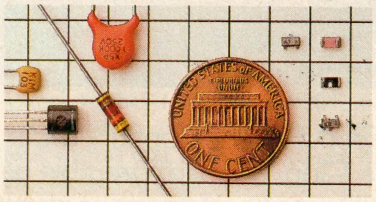
This miniaturization is possible only with SMDs (Surface Mounted Devices), micro-electronics common in satellites but unprecedented in radar detectors. It's no surprise that such a superlative design should be greeted by superlatives from the experts.

"In a word, the Passport is a winner," said *Car and Driver.*

The experts report excellent performance. Simply switch PASSPORT on and adjust the volume knob. Upon radar contact, the alert lamp glows and the variable-pulse audio begins a slow warning: "beep" for X band radar, "brap" for K band. Simultaneously a bar graph of Hewlett-Packard LEDs shows radar proximity.

As you get closer, the pulse quickens and the bar graph lengthens. Should you want to defeat the audible warning during a long radar encounter, a special switch provides silence, yet leaves PASSPORT fully armed for the next encounter. A photocell adjusts alert lamp brightness to the light level in your car. PASSPORT was designed for your protection *and* your convenience.

Small means the size of a cassette tape



In PASSPORT, 102 SMDs (right) do the work of ordinary transistors, resistors and capacitors.

PASSPORT comes with a leather case and travels like a pro, in your briefcase or in your pocket—to the job for trips in the company car, on airplanes for use in far-away rentals. Just install on dashtop or visor, then plug into the lighter. PASSPORT keeps such a low profile. It can be on duty without anyone noticing.

Small means an easy fit in the briefcase

One more PASSPORT convenience—call us direct. It's toll free. We make PASSPORT in our own factory and we'll be happy to answer any questions you may have. If you decide to buy, we'll ship your PASSPORT within 24 hours by UPS, and we'll pay the shipping. For an extra $6.00, Federal Express guarantees 48-hour delivery.

If you're not satisfied within 30 days, return PASSPORT. We'll refund your purchase and your return shipping costs. There are no hidden charges.

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Let's get it together... buckle up.

GM

RED-HOT ATTRACTION.

"Cool down, guys. You've seen a red-hot, optioned-out Z28 before. You've felt the sun pour in through the T-Top. The earth tremble beneath the Eagle GT's. The wind quiver as it's sliced by eight cylinders worth of tuned-port fuel-injected power. You've heard music tweaked so fine, it makes your soul smile. You haven't? Too bad." **Camaro. The Heartbeat of America.**

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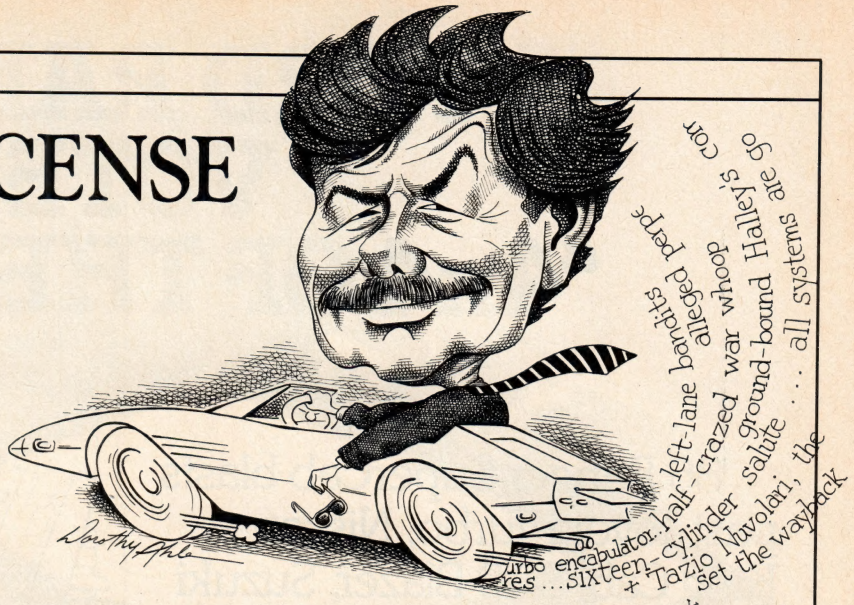


• State representative Patricia Porter of Chittenden County, Vermont, has determined that it's dangerous to allow cats to roam freely inside automobiles. This zealous do-gooder has introduced a bill before the Freedom and Unity State's legislature that calls for restraints—belts or boxes—to keep kitties from perpetrating any more car accidents. Oddly enough, Vermont has no mandatory-restraint law for human passengers. Nor is any bill proposing such a law currently under consideration in the state's legislature.

We have had a belt law in Michigan for nearly a year, but one district-court judge has decided not to enforce it. If you are cited for a seatbelt violation and come before Judge Steven Servaas's 63rd District Court (near Grand Rapids), all you need do is plead guilty, and the $25 fine mandated by the Michigan law will be automatically suspended. Judge Servaas says that he feels the offense isn't very serious, that he believes the law is unconstitutional, and that "people didn't come over to America to have the government tell them how to protect themselves."

What Rep. Porter and Judge Servaas don't realize is that their actions are aiding and abetting the passive-restraint movement. After sixteen years of debate, the federal standard that requires either air bags or automatic belts for front passengers is now ticking like a time bomb and is set to go off during the 1987 through 1989 model years. There is but one escape clause: states representing two-thirds of the country's population must have mandatory-belt-use laws on their books.

Seventeen states and the District of Columbia, representing over half of the U.S. population, have already enacted such laws, and similar legislation is pending in a dozen more states. This does not mean we're home free. To the contrary, Elizabeth Dole, the secretary of transportation, has made it perfectly clear that the state belt laws must have teeth and that the Judge Servaases of the country will have to hold up their end of the bargain with enforcement, or else her department will stick by its planned phase-in of automatic protection, starting with ten percent of the 1987-model-year fleet. In order to count toward the two-thirds goal, the state laws must apply to all front-seat occupants, must impose fines of at least $25, must allow failure to use belts to be just cause for mitigation of damage claims, must initiate programs to encourage belt use, and must be in effect by September 1, 1989.

In spite of the auto industry's $15-million-per-year Traffic Safety Now lobby, which has cajoled many states toward mandatory-belt laws, the results are disappointing. Nevada's statute is a creative but feeble attempt to barter a belt-use edict for a 70-mph speed limit. In California, Connecticut, and Hawaii, the laws specify that the populations of those states must *not* be counted in any tally that would rescind a requirement for automatic restraints. Many states do not impose $25 fines. In fact, only three—Louisiana, Michigan, and New York—come close to satisfying fully the Dole dictum.

It's possible that the secretary will save the day and rule that sufficient seatbelt-law progress has been made, thereby saving us the billions of dollars a year that automatic crash protection would cost, but it's not very likely. The auto-insurance industry long ago identified the air bag as its Holy Grail, and it's quite willing to support lobbying and propaganda campaigns until its goals are reached. And our unappointed, unelected, and unenlightened consumer advocates will undoubtedly keep the pot boiling by suing the federal government whenever necessary to keep passive restraints on track.

They'll also continue to slur the auto industry at every opportunity. Although the car builders have done less than they should have to avoid air bags, their stance on the issue is the only one that makes sense: car consumers have been paying for life-saving seatbelts ever since 1967, and the cost-effective approach to preventing highway deaths and injuries is to use the systems already in place.

Unfortunately, the cracks in the manufacturers' position are widening. VW and Toyota have been selling automatic belts for years. Mercedes broke the ice with air bags during the 1984 model year and now includes automatic driver's-side protection as standard equipment in all of its U.S. cars. Factor in the three new optional applications—BMW's 735i, the Ford Tempo, and the Mercury Topaz—and the number of air-bag-equipped cars on our roads will soon top the 100,000 barrier.

Clearly, the popularity of inflatable restraints is growing. One reason for this is that the air bags already in the hands of the public have performed remarkably well. Air bags also look attractive because the cost issue has been muddled by the strength of the dollar with respect to the deutsche mark: German manufacturers have added passive restraints and other equipment to their cars instead of cutting prices. What's more, the Breed Corporation of Lincoln Park, New Jersey, a respected crash-sensor and military-fuse manufacturer, has conducted several convincing demonstrations of a mechanically triggered air bag that does not require expensive electronic components. In high-volume production, Breed bags might add less than $200 to the price of a new car.

The problem is with the mights and maybes of air bags and automatic belts. What is known is that extra protection costs extra money. That seatbelts are a sure thing. That fatalities are down sharply in states with seatbelt laws (29 percent fewer deaths in Illinois, Michigan, and New York). That such laws have proven effective in 30 other countries. That automobiles will never become completely automatic appliances. And that this is about the last possible chance any consumer will have to take a stand on the issue.

So make up your mind and give Secretary Dole a piece of it. While you're at it, send a note to the editor of your local paper, to your state and federal representatives, to Diane Steed (head of the National Highway Traffic Safety Administration), and, if you can spare the postage, to the president. This is also the right time to have a heart-to-heart talk with that neighbor who refuses to buckle up. And whenever you spot a fellow motorist with his belt hanging limp, give him the old toot-and-tug routine: a beep of the horn to get his attention, then an introductory lesson in how to wear the protection he paid for. It's high time that a few million car enthusiasts made a difference. —*Don Sherman*

FORD RANGER VOTED "4x4 OF THE YEAR!"

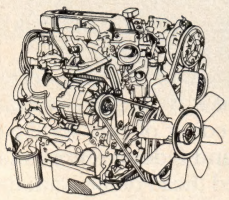
'86 Ranger SuperCab blasts past Toyota Turbo, Nissan King Cab, S-10 Blazer, Suzuki Samurai and Jeep Comanche to win the coveted 4-Wheel & Off-Road award.

Over mountains, beaches, canyons and crags... from Badlands Trail to Big Rocks Road the truck-savvy editors of 4-Wheel & Off-Road magazine drove six top 4x4's through what they called their toughest off-road test ever!

Ford's winning Ranger SuperCab was "...a virtually unstoppable force in the outback." Proving once again that tough guys finish first!

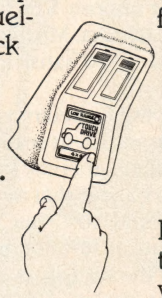
Unbeaten V-6 Power!

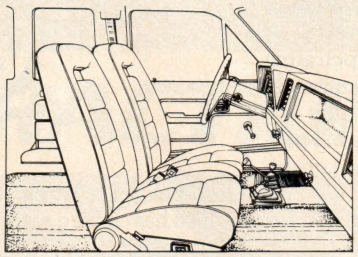
One reason for Ford's winning performance—extra off-road power, 140 horses* in Ford's new, bigger 2.9L V-6 option... electronically fuel-injected for quick response, peak performance.



New "Touch-Drive" system.

Now just touch a button on Ford's new "Touch-Drive" console... shift electrically from 2WD to 4WD high and back at any speed. (Manual locking hubs standard for you traditional off-roaders.)





New Ranger SuperCab.

Ford's new SuperCab is one of the roomiest small pickups—22 cu. ft. behind the split-back front seat. Add the optional rear jump-seats and you'll have the only small pickup that can ride five!

Supertough Truck.

Above all, this Ranger 4x4 is one tough truck—built Ford tough, with a Twin-Traction beam independent front suspension... double-wall construction... tough ladder-type frame. And a payload of 1600 lbs.

Special STX trim..

All this off-road room and toughness comes with all the "goodies," too, in the new Ranger STX optional package—sporty trim, Captain's Chairs, lower two-tone accent, the works. It's the look that says, "4-wheelin', you ain't seen nothin' yet!"

Best-Built American Trucks.

At Ford, quality is Job 1. A 1985 survey established that Ford makes the best-built American trucks. This is based on an average of problems reported by owners in a prior six-month period on 1981-1984 models designed and built in the U.S.

Lifetime Service Guarantee.

Participating Ford Dealers stand behind their work, in writing, with a free Lifetime Service Guarantee good for as long as you own your car or light truck. Ask to see this guarantee when you visit your participating Ford Dealer.

Buckle up—together we can save lives.

*Based on SAE standard J1349.

FORD RANGER

BEST-BUILT AMERICAN TRUCKS

Built Ford Tough


Ford

LETTERS

Our fourth Ten Best issue, and we still didn't get it right . . .

THE GOOD, THE BAD, AND THE OBSCENE

The January *Car and Driver* was definitely one of your ten best. Even the Special Advertising Section was of interest.

Keith B. Colton
Cedar Rapids, Iowa

BILL NEALE

As a past owner of several Corvettes, a Trans Am, and a Mercedes—and now a Mark VII LSC—I applaud your selection of the LSC in "Ten Best Cars." This may be the finest all-around car I've owned yet.

Randy DeGasperin
Rolling Hills Estates, California

The Taurus/Sable may just be the car that begins the march back to the top for Ford. Ford lost their preeminent standing in the twenties because they would not sell anything other than black cars, while GM sold several colors. Now, in 1986, GM is selling the type of schlock that more and more Americans are discontent with. Ford did its homework to finally come up with a car that the yuppies (like me!), and all who follow, are screaming for. Bravo, Ford!

Craig Hendrickson
Beverly Hills, California

Ads for the new Sable claim Mercury has "reshaped" its thinking. That message missed the dealer who sold one I saw on the Interstate, with wide-whitewall tires, an aftermarket vinyl roof, and Mercury-logo mud flaps. The more things change . . .

George Dunham
Schaumburg, Illinois

The only thing uglier than the Taurus is Ford's Aerostar minivan.

J. Eric Howard
Macomb, Illinois

Kudos for your selection of the Volkswagen GTI in "Ten Best Cars." It's an eighties version of a Beetle and a bathtub Porsche rolled into one—a people's car with guts. Dr. Porsche would be proud.

Stu Gatz
Bedford, Massachusetts

Your Ten Best issue was up to its usual excellence. But delete the VW GTI from "Ten Best Cars": it has always been overrated, and it looks like it was hit from behind by a gravel truck. A better car would be the Isuzu Impulse Turbo. It makes the GTI look like a German Chevette.

Mark Jenkins
Canyon Country, California

How could you leave out the Corolla GT-S? In comparison with the GTI and the Prelude, the GT-S seems like a Formula 1 car. The front-drivers stink, especially the overpriced, overassisted, undertired, and underbraked Prelude Si.

Come on, guys, admit it: the rear-drive and rev-happy GT-S is one of the best all-around performers and values on the road today. My unsung hero of the road will continue to blow the doors off of your "Ten Best Cars" for many miles to come.

David "16V" Rulnick
West Hartford, Connecticut

I was thrilled to see that you named the Prelude again this year. Somehow, losing twelve valves due to a worn timing belt hasn't changed my opinion that this is the best automobile I've ever owned.

Burton Diamond
Rockville Centre, New York

How did you manage to leave the RX-7 off of your list again? The vacuum-tube environment in which you test cars has risen to reside firmly between your collective ears. With the dogs on this year's list, you should change your name to *Pet and Owner.*

Gregory P. Hande
Spokane, Washington

No mention of the Mustang GT! Probably the best performance buy in the world, and priced so almost everyone can afford one. Corvette? The rattle-and-shake king from GM is grossly overpriced. And how can you pick the 944 over the new RX-7? I would not trade my Mustang GT for any two of your choices.

Bob DeGenaro
Redding, California

When I saw that *C/D* did not deem the Volvo 740 Turbo one of the "Ten Best Cars," I went down to the garage to break the bad news to Olaf, our 740 Turbo. Olaf said he didn't mind the slight and asked to look at the issue. I left the magazine with him and went back upstairs.

A short while later, I heard laughter from the garage. I went to investigate and was surprised to hear the laughter coming from under Olaf's hood. I asked him if he was reading "Ten Best Jokes."

"I'm looking at the best joke in the issue," he chuckled. "Know why the Audi 5000 is so red?" he asked, scarcely able to contain himself. "You'd be red, too," he roared, "if you were constantly being mooned by turbo Volvos you couldn't catch. Har! Har! Har!"

Olaf says to keep up the good jokes. For his part, he plans to make sure red remains the most appropriate Audi 5000 color.

John Kupiec
Springfield, Virginia

If you proseheads are going to pick a "flingable flier" as one of your "Ten Best Cars," then how about one with a racetrack record—the Honda CRX? Are you afraid your readers will be bored if you tell them too often how good Hondas are? The MR2 is cute—if you like X1/9s—but where is Mr. Two when they're passing out trophies in the winner's circle?

J. Bradbury
Gainesville, Florida

We hate to confuse you with facts, but both the CRX and the MR2 fared well on the track last year. The latter won the Touring Class laurels in IMSA's Firehawk Endurance Series—Ed.

Csaba Csere did a beautiful job of encapsulating the lives of the ten best engineers in automotive history. But there is, of course, one flaw in the "ten best" approach: sometimes there are more than ten best, maybe eleven best. One of my heroes was Walter P. Chrysler, whom I consider second only to Henry Ford in the shaping and structuring of the American automobile's destiny.

Ted Howell
Marrero, Louisiana

Imagine my horror, disbelief, and anger at not finding Colin Chapman's name mentioned anywhere in Csaba Csere's "Ten Best Engineers." How could you ignore such a brilliant designer, engineer, driver, constructor, and businessman? The man responsible for either designing or developing the monocoque chassis, inboard-mounted disc brakes and suspension units, engine-mounted suspensions, the wing car (venturi), and the Chapman strut suspension and Lotus fiberglass-molding techniques for road-car bodies.

My list is surely incomplete, but who was it that developed the Vanwall into world-class material? Who turned Indianapolis around (literally, from the driver-engine perspective)? Who first really had us consider power-to-weight ratio as a means of extracting excitement from small engine packages? Doesn't anyone remember the Lotus 7?

Please now, do the gentlemanly thing: shoot tech editor Csere and add Colin Chapman's name to your list.

J.R. Kenyon
Calgary, Alberta

We have granted Csaba a stay of execution in order that he may someday write "Ten Best Race-Car Engineers," in which Chapman's name is sure to figure prominently—Ed.

Merkur XR4Ti from Germany. To the question, How well does it perform?

The sports sedan that asks, How well can you drive?

Its presence alone creates a challenge. Who is this that dares to question the superiority of BMW, Saab and Audi?

It is the Merkur XR4Ti from Germany. And its challenge is rooted firmly in its ability to perform.

XR4Ti takes a sophisticated approach to performance. Its power comes from the advanced technology of blow-through turbocharging and multi-port fuel injection. The result is 175 horsepower (SAE) from a compact 2.3-liter overhead cam 4-cylinder engine. Its redline is an exhilarating 6200 rpm. The suspension is fully independent.

Even XR4Ti's shape enhances its performance by managing the flow of air over, under and around the vehicle. The results are excellent directional stability and improved fuel efficiency.

XR4Ti takes a functional approach to comfort, catering to the driver's needs—whether running down a twisting country road or locked in rush hour traffic.

Merkur XR4Ti was designed and engineered to surpass the demands of serious drivers. It's ready to accept your challenge.

The next move is yours.

For more information, visit a Lincoln-Mercury-Merkur dealer or call **1-800-822-9292.**

MERKUR XR4Ti

Advancing the art of driving.

Designer Label.

Most brand-name auto parts are good. But that isn't good enough for Mr. Goodwrench. He recommends the *designer* label: Genuine GM Parts.

GM parts are designed by many of the same people who designed the original parts on your GM car.

They're engineered to work together as complete units with your GM car's various systems. And built to strict GM quality standards. Including GM Goodwrench branded parts, which are available only at GM dealers.

So whatever GM car you have—and whatever GM parts you need—see Mr. Goodwrench.

No one knows your GM car better than Mr. Goodwrench. No one. GM Goodwrench Shock Absorbers are *system*-engineered for your suspension *system*. Ask for them.

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On behalf of Cosworth Vega owners everywhere, our thanks for the selection of the Cosworth as one of the "Ten Best Collectibles." It must be the most technically sophisticated vehicle ever produced in this country, and it was all accomplished nearly twelve years ago by a team of dedicated engineers at Chevrolet. They saw the future long before Toyota, Mercedes, Chrysler, or the other myriad of four-valve Johnny-come-latelies.

If anyone would like more information on the Cosworth Vega, I can be reached at Box 910, El Toro, California 92630.

Robert A. Maloy
Founder and Past President
Cosworth Vega Owner's Association
Mission Viejo, California

Bravo, Pete Lyons! I own several cars: a 1984 300SD Benz, a 1983 380SL, and then there is my true love, my 1979 Seville. I'm glad that someone has had the foresight and good taste to talk up my modern classic. When I look at the beach-ball look of the new cars, I enjoy my Seville even more.

M. Overland
Hemmingford, Quebec

Shame on you! You missed the Volvo Bertone Coupe. With the approaching introduction of the new Bertone Coupe at probably $35,000 plus, the first series becomes very attractive as a car to collect. There are very few cars (new or used) that can touch it for exclusivity, dependability, and comfort. And with the four-year production of 6622, it is much more rare than some of the cars you did include.

James F. Mincey, Jr.
San Francisco, California

C'mon, guys. Your list is a primer for beginners or not-too-serious collectors. You missed what might be the most exciting cars of the seventies: the British TVR sports cars. And to list the Triumph TR8 is laughable. It and the TR7 broke all-time records as the world's most shoddy and unreliable cars. They killed the Triumph company that the TR6 and the Spitfire had been keeping alive.

Kent Martin
Address withheld

When I examine the "Ten Best Collectibles," I wonder, "Why didn't you *tell* me???" If you had, maybe I'd have bought one instead of one of the ten *least* collectibles. Did you ever tell us readers that the Cosworth Vega and the Beetle convertible and the TR8 were the cars to buy? *Nooooo.* So what did we buy? A damn Granada!

J.W. Lord
Janesville, Wisconsin

The January issue is your best yet. The article I enjoyed most was "Ten Best Roads of Europe." I thought it was just short of fantastic: there just wasn't enough. If possible, I would like to see it expanded into a full feature article.

Walter H. Waugaman
Fayetteville, Arkansas

After reading Griffin's "Roads of Europe," I decided to take my brand-new, bright-red 944 Turbo and head over to the Old Country. Unfortunately, the Porsche is stuck in the garage behind my broken-down Countach. Hell, I guess I'll just jump in the BMW and check out a few of Brock's favorite racetrack eateries.

Jimmy the Meat
Never-Never Land

I have found an error in your "Ten Best Performers." According to your Road Test Review, the Ferrari Testarossa went from 0 to 60 in 5.0 seconds, which is 0.7 second faster than the 928S.

Tommy Daughdrill
Brooklyn, Mississippi

Why did you pick the Trans Am over the Ferrari GTO as the best roadholder? In September you said the GTO "will centrifuge its driver all day long at 0.88 g."

Donald Holloms
Miramar, Florida

As the "Performers" introduction stated, eligibility for Ten Best honors was limited to "EPA-certified, mass-produced automobiles." Neither the GTO nor the Testarossa we tested met this requirement—Ed.

You stated that no other car came within 15 mph of the 944 Turbo's 157-mph top speed, except the 928S. Correct me if I am wrong, but the Corvette did 150.

You also stated that the 944 Turbo's speed was due to "training sessions on the autobahn." Tell me, did you receive any training in mathematics?

Bob Bertani
Grosse Pointe Woods, Michigan

Apparently more than you received in remedial reading. Our introduction also stated that only cars "tested in the last twelve issues" were eligible for "Performers" honors—Ed.

Thank you for again providing your faithful readers with another action-packed Ten Best issue. My only negative comment concerns "Ten Best Races." Obviously, none of you has ever experienced the excitement of the June Sprints at beautiful Road America in Elkhart Lake, Wisconsin. Here one will find three days of the best racing anywhere. Once you go, you'll keep coming back. I've been doing so for ten years, and that is more than half my life.

Thomas Herman
Waukesha, Wisconsin

You made a grave error by not including the NHRA Springnationals. Just because we Ohio University students are more intellectual than your average clodhoppin' redneck doesn't mean we don't love a rip-roaring good drag race, and it surely doesn't mean you're going to get off easy.

Since you were so callous, why don't you devote half an issue to them? Like, in full color; just call it a Special Advertising Section. You do want to keep the bones in your body in reasonable condition, don't you? Sure. And before you go, let me warn you that while the Springnationals isn't the biggest series of eliminations around, it is the loudest. The fishing in Buckeye Lake is ruined until after the Fourth of July.

The Springnationals is held every June at the National Trails Raceway, outside of Buckeye Lake, Ohio. So take off, eh?

Robert Sindeldecker
Athens, Ohio

You made a grave error in "Ten Best Races," referring to the Raiders as being from Oakland. In the 1983–84 season, the Raiders moved from Oakland to our fair city of Los Angeles. That year, they brought home to us the Super Bowl championship. As for your comment regarding "a strapless evening gown and an M-16" as being appropriate attire for L.A., well, Chief of Police Daryl Gates says, "Definitely not. They must have us confused with the city of West Hollywood." We do, however, approve of "Willie Nelson Is a Wimp" T-shirts.

Name withheld
Los Angeles, California

Kudos to Brock Yates! Not only did he pick the Daytona 500 as one of the "Ten Best Races," but he found the best steakhouse in the world. I enjoyed the best T-bone of my life last night at Gene's. If anybody reading this is thinking of going there, ask for Tammy as your waitress.

Andrew C. Brunetto
Daytona Beach, Florida

After reading "Ten Best Racetrack Eateries," an interesting circle of events came to mind concerning the bratwurst at Road America: After consuming the brat, the customer/victim is soon forced to use the rather nice trackside facilities (nice compared with Nelson Ledges, at least). These facilities are then pumped out by Farmer Brown, who spreads it on his cornfields, who then feeds the corn to his pigs, which are then slaughtered and made into . . . bratwurst! With a racket like that, it's no wonder the track is so nice. I'll be there every year, but with my own hibachi.

Bradley Martin
Walled Lake, Michigan

The gold cover certainly made your January issue seem classy, and I did feel there was a real quality to the articles therein. Then I got to "Ten Best Jokes," and I was appalled! I can in no way imagine why you

would include the filthy joke attributed to Eddie Murphy. Please cancel my subscription immediately.

John D. Sholly, Jr.
Reading, Pennsylvania

The last place in the world one would expect to find gross jokes would be in an auto mag. You have made the decision to subscribe to either *C/D* or *Road & Track* a very simple one. Adios, amigos!

R.G. Morrison
Tucson, Arizona

Was it necessary to publish that so-called joke in a magazine that is read by young people? Some of them hear enough of this language without having to read it in what I thought was a top-rate publication.

Jane L. Keller, Librarian
Ephrata Junior High School
Ephrata, Pennsylvania

I was appalled to find an actual swear word in your hallowed pages. You people are truly sick! I mean, my two-year-old son just may pick up this book in six or eight years.

Half-Safe: The Untold Story

I was delighted to see that "Half-Safe," the globe-girdling amphibious jeep, made your "Ten Best Amazing Stories." I was disappointed, however, that the story ended on a note of mystery—and that I was part of that mystery. Years ago I provided the *Guinness Book of World Records* with an account of the Pacific crossing, but for some reason they have not seen fit to update the material.

To clear up some of your questions, Elinore, Ben Carlin's American wife, jumped jeep in India and eventually got a divorce. Since it was essential that he have a mate (the nautical kind), Carlin flew to Perth, Australia (his home town), and recruited a young yachtsman. This young man lasted until "Half-Safe" reached Kagoshima, Japan, in late 1956.

At that time, I was working as the editor of *Today's Japan* magazine and serving on the staff of the *Japan Times.* I interviewed Carlin and found him to be an Australian redneck. He was, however, a master mechanic and navigator.

Carlin began advertising for a mate. There were no takers. In February 1957 he asked me if I would like to take an ocean voyage. (I had told him about having been in the navy and liking the sea.) His only conditions were that I learn how to operate one of his cameras and that I not write about the voyage for five years after it was completed. I said yes.

Before we left, Carlin spent several weeks at a Shell Oil plant, working on a huge, torpedo-shaped tank that was to serve as a floating gasoline supply and be pulled behind "Half-Safe."

We left Tokyo on May 3, 1957, heading north toward Hokkaido. Carlin had arranged for Shell to provide the gas for the first portion of the Pacific crossing, and the company assigned a Japanese PR man to accompany us and arrange for publicity along the way. That night we put up in a famous hot-springs spa, which had been arranged by the PR man. Carlin got rip-roaring drunk, dragged a good-time girl into our room at two a.m., and had to be physically restrained. When we got up the next morning (Carlin with a horrendous hangover), our PR man was gone. We never saw him again.

We drove on to Morioka on the northern end of Honshu Island, where we were hosted by the local general manager of Shell and representatives of the mayor's office. That evening we were treated to a night in the red-light district.

The next day, cold and raining, we drove the jeep into Mutsu Bay to cross the Strait of Tsugaru to the port of Hakodate in Hokkaido. This was my first experience with "Half-Safe" at sea. An hour out (top speed was three knots per hour), the jeep sprang a leak in the hull, requiring constant hand-pumping. It took us all night and well into the next day to reach Hakodate.

The first night there, we were put up in a whorehouse that was going out of business (prostitution had been made illegal in Japan on April 1, 1956, with one year's grace period), and the following day we were treated to a press reception and a formal lunch by city dignitaries.

We drove on to Wakkanai, on the northern tip of Hokkaido, and were put up at a U.S. Army intelligence outpost. The first night there, Carlin got drunk and ended up sleeping on the front-room floor of the post commander.

The next five days were taken up with repairs on the jeep and getting the gas tank ready for the launch. On the day of our departure, we took off from the army post, led by a caravan of army vehicles and cars loaded with people intending to see us off. About two miles from the post gate, the jeep blew a water gasket. Without any effort to let the caravan up front know what had happened, Carlin drove "Half-Safe" back to the base.

The next day we made it to the docks. While the TV cameras whirred and the crowd cheered, I climbed aboard "Half-Safe." Carlin shook hands with all the dignitaries and then jumped onto the jeep from the dock.

His impact on the jeep busted one of the neoprene panels making up the cabin housing. The departure was off. Repair took up the rest of the day. Too embarrassed to go back to the base again, we spent the night on "Half-Safe."

By the next morning, another crowd, about half the size of the one the day before, had gathered. TV cameramen asked us to make two false starts to give them ample opportunity to get footage. Each time the jeep took off, I was responsible for hauling the huge gasoline tank up close to the fantail to keep it from ramming us or fouling the propeller when Carlin swung us around to return. It was exhausting work.

Finally we were off for real, with a passel of boats escorting us. I was so exhausted that I was on the verge of passing out. I was also starving, so I wolfed down a can of whitebait. Within seconds I was hanging over the side of the jeep, puking, while our escorts continued to take pictures of the historic event.

This was the beginning of one of the most extraordinary ocean crossings and odysseys ever made by man—a trip that ended for me some four months later, in Anchorage. Like his partners before me, I left the irascible Carlin; I flew home to Phoenix to recuperate. Weeks later I saw in the paper that he had arrived in California, gotten drunk at a party, and run "Half-Safe" into a ditch.

Soon after that, I returned to Japan. About a year later I saw in the press that Carlin had made it back to New York, his official starting point.

Another two years later, I heard from my family in Phoenix that Carlin had come through, still aboard "Half-Safe," on a lecture tour.

In the mid-1960s my account of the adventure was published in Tokyo under the title of *Once a Fool: From Tokyo to Alaska by Amphibious Jeep.* It sold out quickly. The publisher's facilities burned down shortly thereafter, destroying the balance of the stock, the plates, etc., and it was not reprinted. I ended up with half a dozen bound, typewritten copies.

In the late 1960s, after I had returned to Phoenix, one of my friends called and described a vehicle he had just followed down the city's main east-west thoroughfare. It was "Half-Safe." Carlin was still on the road.

In the late 1970s, a man named John Rohrbough, whom I had met in the Aleutians and who subsequently became a lifelong friend, wrote to me from Perth, Australia, where he lived, saying that Carlin had returned to Perth some years before, worked at a yacht harbor, and died of a heart attack.

Boye Lafayette De Mente
Paradise Valley, Arizona

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LETTERS

I can picture it now, the poor little bastard rolling around on the floor, laughing his ass off, just like his dad did today. He might actually learn to spell all those words he's already learning.

All clowning around aside, don't let the tons of protest mail get you down.

Buzzman
Pittsburgh, Pennsylvania

Thanks for printing Eddie Murphy's joke. I learned a new word!

Shirley Redcay
Fort Myers, Florida

It's difficult to understand why a respectable magazine, published by intelligent and literate writers, should consider the ultimate vulgarity of Murphy to be a joke. I heard that identical language while guarding a bunch of ignorant prisoners at Fort Knox during the war.

Niblack Thorne
Phoenix, Arizona

Were the prisoners as tough to deal with as the goldbricks?—Ed.

The fourth annual Ten Best issue was poignant, educational, and more fun than a bathtub full of otters.

Randy S. Arseneau
Plainville, Massachusetts

So many otters, so little time—Ed.

DIAL 911

The vehicle with the "best sex appeal" is the new Porsche 911 Turbo you tested. The thing is *awesome* and *red* and *curvy.* I guarantee you guys a lifetime subscription if you get Marilu Henner to seduce me into a 911 Turbo one warm California evening. Please print this so Marilu will get ideas.

Steve Weiman
Aurora, Colorado

You have discovered what many Porschephiles have known for some time: the 930 Turbo is best left as a memory. Your article claims that all substitutes for the real thing are obsolete, but I feel that a much better car is the 1984–85 Carrera Turbo-Look. It has all the engineering updates and improvements of the legendary 911, is a better all-around performer, and has the look of the real thing.

Paul Thomas, Jr.
Maramec, Oklahoma

I am truly sorry that the 911 Turbo did not live up to Ceppos's memories, but that is his problem. It certainly lives up to mine. It may not be state-of-the-art technology or easy for a neophyte to drive, but I can think of no other vehicle near its price (which eliminates the Countach) that can provide such awesome entertainment and quality of workmanship. I wish Ceppos had approached the assignment a bit more objectively. Your article should have been entitled "Ceppos Compares the '86 911 Turbo with His Recollection of the '79 Turbo."

Alex Owen
Brookline, Massachusetts

Based on your statistics, the 911 Turbo outperforms the 928S in 0-to-60 and quarter-mile tests. It has a top speed 2 mph slower than the 944 Turbo's, stops one foot longer than the Audi 4000S, and is 0.04 g less sticky than the Trans Am. Yet this car "didn't awe" Rich Ceppos and "may have been better left undisturbed." Just what does "awe" Rich Ceppos?

John K. Sackett
Fort Ord, California

Well, there was that press trip with Marilu Henner and the bathtub full of otters—Ed.

GRAND AMPLIFICATION

Larry Griffin claims all the Pontiac Grand Am SE needs are good dials, better seats, and more motor. He says that about every car, so maybe the Grand Am is worth a look. But wait! GM front-driver . . . that means no five-speed. Good handling or no, the car can't be much fun. Come on, GM, put your engineers to work on a five-speed for the Grand Am—and the 6000STE, and the Sunbird Turbo, and the Fiero GT, and . . .

Brian Kirking
Hermosa Beach, California

The Grand Am SE is the same old story from GM: lack of horsepower. Why is it Nissan delivers a V-6 of the same size with 40 hp more? Come on, GM, give us the kind of technology we get from Honda, Toyota, BMW, etc. It will be better for sales than any advertising you can do.

Walter J. Boyles
Eatontown, New Jersey

I'am forced to act as your fourth-grade English teacher. In your January issue on page 100 in the first sentance of the third paragraph Larry Griffin used a period where a colon would have been grossly more accurate; thank you, I can sleep now.

Vito Ippolito
Schiller Park, Illinois

Your first sentence contains an apostrophe that should not be there. In the first clause of your second sentence, "sentence" is misspelled, three commas would be appropriate, the words "grossly" and "accurate" are used grossly and inaccurately, and the semicolon should be a period. Finally, "thank you" should also be followed by a period, and your name is . . . oh, the hell with it—Ed.

BURGS, BOZOS, AND BABIES

Yates's column bashes the movie *Prizzi's Honor* for wrongly saying that the neoclassic Excalibur is built in Japan. Brock says it's built in Milwaukee. Wrong, exhaust breath: the Excalibur is built in West Allis, Wisconsin's sixth-largest city. For your information, Brock, West Allis lies west of

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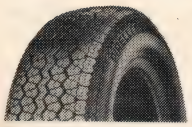

Pirelli P5

Steel belted radial tubeless blackwall.

185/70HR14	$83	205/70VR15	$126
195/70HR14	99	215/70VR15	130
205/70HR14	101		

Pirelli P3

Steel belted radial tubeless blackwall.

145SR13	$25	165/70SR13	$36
175SR13	40	175/70SR14	42
185SR14	45	185/70SR14	48
165SR15	42	195/70SR14	52

Pirelli P700

Steel belted radial tubeless blackwall.

205/55VR16	$219	245/45VR16	$254
225/50VR16	232		

Pirelli P7

Steel belted radial tubeless blackwall.

205/60VR13	$110	225/50VR15	$183
205/55VR14	138	285/50VR15	235
225/55VR14	150	225/50VR16	198
205/55VR16	187	265/50VR16	225
195/50VR15	110	285/40VR15	224
205/50VR15	162	345/35VR15	257

Firestone S-211

Steel belted radial tubeless blackwall.

185/70SR14	$45

Firestone S-660

Steel belted radial tubeless blackwall.

185/60HR14	$61	205/60HR15	$74
195/60HR14	66		

Pirelli P77

Steel belted radial tubeless.

P185/75HR14w	62	P205/70HR13w	61
P195/75HR14w	67	P185/70HR14b	66
P205/75HR15b	79	P195/70HR14b	67
P205/75HR15w	73	P195/70HR14w	62
P215/75HR15w	83	P205/70HR14b	75
P175/70HR13b	58	P205/70HR14w	69
P185/70HR13b	62	P225/70HR15b	93
P205/70HR13b	66	P225/70HR15w	86

b-blackwall w-whitewall

Pirelli P4 & P44/70

Steel belted radial tubeless blackwall.

145SR13	$30	185SR14	$46
155SR13	35	175/70SR13	42
165SR13	38	185/70SR13	46
175SR13	42	185/70SR14	50
165SR14	42	195/70SR14	54
175SR14	44		

Pirelli P6

Steel belted radial tubeless blackwall.

185/70VR15	$109	205/60VR14	$115
185/65HR14	79	225/60HR14	109
185/60HR13	72	225/60VR14	120
205/60HR13	94	195/60HR15	95
185/60HR14	79	205/60HR15	107
195/60HR14	87	205/60VR15	122
205/60HR14	100	215/60VR15	139

Pirelli P8

Steel belted radial tubeless blackwall.

185/65SR15	$63	185/65TR15	$65

Yokohama A008 Japan

Steel belted radial tubeless blackwall.

175/70HR13	$73	225/60HR14	$118
185/70HR13	78	195/60HR15	105
185/70HR14	82	205/60VR15	125
195/70HR14	89	215/60VR15	136
205/70HR14	97	205/55VR16	187
205/60HR13	97	195/50VR15	130
185/60HR14	89	205/50VR15	153
195/60HR14	100	225/50VR15	172
205/60HR14	111	225/50VR16	191

Dunlop D40

Steel belted radial tubeless blackwall.

205/55VR16	$193	225/50VR16	$191
245/45VR16	266		

Dunlop D4

Steel belted radial tubeless blackwall.

185/70VR15	$95	215/60VR15	$164

Goodyear (Eur.) NCT

Steel belted radial tubeless blackwall.

185/60HR13	$68	205/60HR15	$106
205/60HR13	88	205/55VR16	173
185/60HR14	75	195/50VR15	100
195/60HR14	82	205/50VR15	152
205/60HR14	94	225/50VR16	196
195/60HR15	89		

Fulda Y-2000

Steel belted radial tubeless blackwall.

185/70VR15	$88	205/60VR15	$99
185/60HR13	63	215/60VR15	120
205/60HR13	79	205/55VR16	146
205/60HR13	82	195/50VR15	96
185/60HR14	70	205/50VR15	128
195/60HR14	76	225/50VR15	135
205/60HR14	84	225/50VR16	156
205/60HR15	97		

BFG Comp T/A USA

Textile belted radial tubeless blackwall.

185/70VR13	$77	205/60VR15	$102
195/70VR14	89	215/60VR15	119
205/70VR14	93	205/55VR16	169
185/70VR15	85	195/50VR15	112
205/60VR13	82	205/50VR15	155
195/60VR14	79	225/50VR15	166
215/60VR14	99	225/50VR16	186

Continental TS771

Steel belted radial tubeless blackwall.

165SR13	$40	165SR15	$48
175SR14	51	185/70SR13	50
185SR14r	61	185/70SR14	54
155SR15	43	195/70SR14	58

r-reinforced (load range D)

Continental CH51

Steel belted radial tubeless blackwall.

175/70HR13	$68	205/70HR14	$88
185/70HR13	71	185/65HR15	82
185/70HR14	77	195/65HR15	85
195/70HR14	82	205/65HR15	92

Continental CS21

Steel belted radial tubeless blackwall.

155SR13	$36	185SR14r	$61
165SR13	40	165/70SR13	41
165SR14	47	175/70SR13	44
175SR14	51	185/70SR13	49
185SR14	56	185/70SR14	54

r-reinforced (load range D) CR21

Continental CH41

Steel belted radial tubeless blackwall.

185/60HR14	$81	195/60HR14	$88

Continental CV51

Steel belted radial tubeless blackwall.

195/65VR15	$94	205/65VR15	$101

Kléber C1

Steel belted radial tubeless blackwall.

155SR12	$31	175SR14	$45
145SR13	30	185SR14	47
155SR13	32	185SR14r	54
165SR13	36	165SR15	41
165SR14	40		

r-reinforced (load range D)

Kléber V12 & V15

Steel belted radial tubeless blackwall.

155SR12	$31	185SR14r	$54
145SR13	30	155SR15	39
155SR13	32	165SR15	41
165SR13	36	165/70SR13*	33
175SR13	39	175/70SR13*	36
165SR14	40	185/70SR13*	41
175SR14	45	175/70SR14*	42
185SR14	48	185/70SR14*	45

r-reinforced (load range D) *V15 design

Kléber V12GTS

Steel belted radial tubeless blackwall.

175/70HR13	$47	195/70HR14	$62
185/70HR13	53	205/70HR14	69
195/70HR13	58	185/70HR15	57
185/70HR14	57		

Kléber C50

Steel belted radial tubeless blackwall.

185/60HR14	$54	195/60HR15	$66
195/60HR14	60		

Uniroyal-Europe Rallye 280 70-series photo

Steel belted radial tubeless blackwall.

145SR10	$32	155SR15	$45
155SR12	37	165SR15	48
145SR13	36	165/70SR13	43
155SR13	40	175/70SR13	47
165SR13	43	185/70SR13	52
175SR13	51	185/70SR14	57
165SR14	46	175/70SR15*	58
175SR14	54	185/65TR15	65
185SR14	61		

*Uniroyal-Europe Rallye 180 in this size.

Vredestein Sprint ST & ST70 70-series photo

Steel belted radial tubeless blackwall.

155SR12	$32	175/70SR12	$38
145SR13	32	165/70SR13	38
155SR13	34	175/70SR13	40
165SR13	36	185/70SR13	44
175SR13	40	195/70SR13	47
165SR14	39	185/70SR14	47
175SR14	44	195/70SR14	51
185SR14	46	205/70SR14	54
155SR15	39	185/70SR15	49
165SR15	40	205/70SR15	60
185SR15	48		

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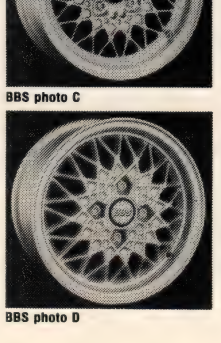
4000, Coupe	6Jx14 D	113
4000 Quattro	6Jx14 D	117
4000 Quattro, 5000	6Jx15 D	130
BMW		
320i	6Jx13 C	103
320i	6Jx15 C	156
320i	7Jx15 C	168
318i, 325e	6½Jx14 D	126
318i, 325e	6Jx15 D	139
318i, 325e	7Jx15 D	168
5, 6 and 7 series	7Jx14 C	142
5, 6 and 7 series	7Jx15 C	187
5, 6 and 7 series	7Jx16 C	210
5, 6 and 7 series	8Jx16 C	218
Mercedes Benz		
190 with 14" oe	6Jx14 D	128
Types 124, 201	7Jx15 D	165
107, 116, 123, 126	6½Jx14 C	130
107, 116, 123, 126	7Jx15 C	187
107, 116, 123, 126	7Jx16 C	210
Porsche		
911SC, Turbo, 944	7Jx15 C	195
911SC, Turbo, 944	8Jx15 C	203
911SC, Turbo, 944	7Jx16 C	214
911SC, Turbo, 944	8Jx16 C	222
Volkswagen		
Golf, Rbt., Scir., Jetta	6Jx13 D	97
Golf, Rbt., Scir., Jetta	6Jx14 D	113
Golf, Rbt., Scir., Jetta	6Jx15 D	127

*gold center/polished rim-add $10.

BBS photo C



BBS photo D

Uniroyal-Europe Rallye 340 70-series photo

Steel belted radial tubeless blackwall.

175/70HR13	$63	205/65HR15	$107
185/70HR13	69	205/65VR15	122
175/70HR14	70	185/60HR14	67
185/70HR14	76	205/60HR14	85
195/70HR14	87	185/60HR14	75
205/70HR14	94	195/60HR14	81
185/65HR15	79	195/60HR15	89
195/65HR15	93	205/60HR15	104
195/65VR15	106	205/60VR15	113

Englebert Max 1

Steel belted radial tubeless blackwall.

155SR12	$31	165SR15	$41
145SR13	29	165/70SR13	36
155SR13	32	175/70SR13	39
165SR13	35	185/70SR13	42
165SR14	40	185/70SR14	47
175SR14	43	195/70SR14	54
185SR14	46		

Max 1 is identical to the Rallye 180

Vredestein Sprint +

Steel belted radial tubeless blackwall.

155SR12	$33	165SR14	$41
145SR13	33	175SR14	46
155SR13	35	185SR14	48
165SR13	37	165SR15	42

Semperit Hi-Speed

Steel belted radial tubeless blackwall.

175/70HR13	$49	185/60HR13	$55
185/70HR13	54	205/60HR13	70
185/70HR14	60	205/60VR13	79
195/70HR14	68	185/60HR14	61
195/70VR14	86	195/60HR14	71
205/70HR14	75	205/60HR15	86
205/70VR14	90	205/60VR15	96

Rial Light Alloy Wheels

Made in West Germany, each Rial wheel is designed with the proper offset and dimensions for a specific vehicle. They're precisely cast and machined to insure trouble-free uniformity, x-rayed for strength and tested for air tightness.

Free mounting and balancing

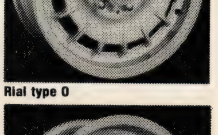
Rial wheel prices include cover caps and wheel nuts or bolts. If purchased with tires, you get free mounting, valves and computerized dynamic balancing.

Made for	Size/Type	Silver ea.
Audi		
Fox, 4000	6Jx13 N°	73
Coupe to 84, 4000	6Jx14 N°	84
Coupe to 84, 4000	6Jx15 °	111
Coupe 85 on	6Jx14 N°	84
4000 Quattro	6Jx14 N°	84
5000 except Turbo	6Jx14 N°	84
BMW		
320i	6Jx13 N°	75
320i	6Jx15 N°	115
320i	7Jx15 N°	119
318i	6Jx14 N°	84
318i, 325e	6Jx15 °	111
318i, 325e	7Jx15 °	119
5, 6 and 7 series	7Jx14 N°	90
5, 6 and 7 series	7Jx15 N°	120
Ford		
Fiesta	6Jx13 N	73
Honda		
Prelude, Civic 80 on, Accord 82 on	6Jx13 N°	73
Prelude, Civic 80 on, Accord 82 on	6Jx14 N°	84
Prelude, Civic 80 on, Accord 82 on	6Jx15 °	111
Mercedes Benz		
Types 116, 123	6Jx14 O°	68
107, 116, 123, 126	6½Jx14 O°	70
107, 116, 123, 126	7Jx15 N	120
107, 116, 123, 126	7Jx16 N	129
190 with 14" oe	6Jx14 N°	90
Porsche		
911SC, Turbo, 944	7Jx15 N°	120
911SC, Turbo, 944	8Jx15 N°	129
911SC, Turbo, 944	7Jx16 N°	128
911SC, Turbo, 944	8Jx16 N°	140
Volkswagen		
Golf, Rbt., Scir., Jetta	6Jx13 N°	73
Golf, Rbt., Scir., Jetta	6Jx14 N°	84
Golf, Rbt., Scir., Jetta	6Jx15 °	111

*Type N with gold painted center/silver painted rim - add $4; gold or black center/polished rim - add $12.

°Ronal R4 look-alike may be substituted

Rial type O



Rial type N

Rial type N for front wheel drive

LETTERS

the village of West Milwaukee, which lies west of the city of Milwaukee. Clear?

Chester D. Kass, Chief of Police
Greenfield, Wisconsin

Sorry, Chief. Yates drove through there too fast to pick up all the details—Ed.

Yates directed some very low, cheap, and unfounded remarks at the Ford dealer network and sales force. In the past five years, Ford has made great strides in product development, styling, performance, and service, and this was not done entirely by the boys in the Glass House. It involved thousands of factory workers and also the guys in the trenches: the dealers and the parts, service, and sales people.

We who represent Ford products are not all "fat-boy dealers" and "sales bozos." We're *professionals.*

Kii Z. Fisher
Engle Ford, Inc.
Millersburg, Pennsylvania

As a former employee of your magazine, I felt cheated by Yates's column. I am a car salesman, and I know our products inside and out. We are tested on the cars we sell. I understand the perception you have of car salesmen, and it is not unwarranted. But times and people have changed our role. Well-educated and well-dressed men and women are what you will find today.

Michael Brueger
John Lee Oldsmobile-Saab, Inc.
Ann Arbor, Michigan

We knew when we fired you that your future wasn't exactly bright, but we never imagined it would come to this—Ed.

Brock Yates speaks of "cars displaying the infuriating sign 'Baby on Board.'" I have been pondering the meaning of this sign, and two explanations come to mind: (1) Those who display it are proclaiming a newfound fertility that they were so diligently trying to suppress in their premarital days. (2) They are giving me an admonishment to drive carefully around the car carrying their precious poo-poo. Well, forget it. There are already two things keeping me careful: the desire to keep my autos damage-free, and Smokey. Their sign is not going to make me a better driver.

The irony is that they usually display this sign in the middle of their back windows, obstructing the rear view. Of course, in typical yuppie fashion, these people are only looking ahead, anyway.

Kent R. Cherne
Aurora, Colorado

Why does Yates have an "urge" to rear-end "Baby on Board" cars? Obviously a repressed wish that some tailgater had lobotomized him before he grew up to write insanity like this!

Dr. Detroit
Marietta, Georgia

Yates is way out of line. Being a 43-year-old father of a two-year-old, I can tell you that having a small child is one of the neatest things that can happen to a person. And if Yates, or any other maven, rear-ends my car on purpose and causes injury to my baby, he may end up wearing a very neat .45-caliber hole between the eyes. Hurt my kid, you hurt. Period.

J.M. LaNier
Medford, Oregon

The sign is there to tell turbo turds like you, Yates, that when you rear-end my car you'll be paying for my son's college education, after I sue your redneck ass right down to your Pic-Way boots.

By the way, we'll be unscratched, thanks to our seatbelts and baby seat, which is more than I can say for your improved face after it's scraped off your windshield.

Ken and Luke Bertoli
Atlanta, Georgia

Yates's question as to why he gets "this awful urge" should be answered quickly by his psychiatrist. This type of dark humor should be reserved for magazines pandering to people with sadistic urges. Not for those of us who have children and want to protect them from people who wish to rear-end cars with kids on board. An apology is in order.

Richard Lincoff
Los Angeles, California

Your brain, however, is not. If there really are "people who wish to rear-end cars with kids on board," then driving around with a "Baby on Board" sign on display should do about as much to promote your children's health and well-being as letting them play Dungeons & Dragons among junked refrigerators in a toxic-waste dump. If you love your kids, trash the dumb sign—Ed.

RAGING MADD

Apparently you devoted speed heathens fail to see that the Louisiana MADD hot line, which you innocently reported on in FYI, threatens the right to privacy of every driver, drunk or no. Statistics categorically show the threat of the drunk driver, no question. But how long do you think it will be before some self-righteous left-laner summons the man because your car blew past him at twice the limit? I can hear it now: "Hello, state police? Some crazy S.O.B. in one of them there Porshas just passed me on I-70 goin' like a madman. He's *drunk!*" Of course the law-enforcement folks will welcome this opportunity to bust hard-core speeders, especially the hard-to-nail stealth driver.

MADD has done some indisputably fine work. But anyone who supports them in this mindless extension of their crusade should prepare to face the consequences of driving in a true police state.

Bill Visnic
Weirton, West Virginia

FREE PRESS

I read your "Statement of Ownership, Management, and Circulation" in the January issue and noted that you give away an average of 19,482 copies of your magazine each month. Please add my name to this list so that I can read your very entertaining magazine with the knowledge that I'm not paying for those Special Advertising Sections you continue to find necessary.

Randy Madera
Fremont, California

CAPTIVE AUDIENCE

I am requesting information on the Lamborghini Countach and hope you can be of help. I am currently in prison, about to be released, and I have a very large sum of money.

William Barber, 406157
Rosharon, Texas

Many readers have made similar requests, but they lacked conviction. Our road test begins on page 38—Ed.

BRAKING POINT

Claybrook's big red eye has only just begun to make inroads, and already its baleful stare has transformed city traffic from mostly moronic to totally intolerable. If I'm ever obliged to buy a car with one of those Cyclopean safety devices on its package shelf, I'll cover it with an empty prophylactic box.

F.W. Donour, Jr.
Virginia Beach, Virginia

A similar tactic proved quite successful in the last Trojan War—Ed.

PERSONS-OF-FEW-WORDS DEPT.

What?! No ten best advertising sections?

T. Sargent
Charlestown, New Hampshire

We never expected there would be so much demand—Ed.

I finally got my dad to cancel his subscription to *Motor Trend.*

Andy Ryan
Newark, Ohio

Now try to break him of Mickey Mouse—Ed.

My husband's letter last month did not get published.

Laurie Lohmann
Middlefield, Connecticut

If it's any consolation, we do plan to run the photos he sent of you and the otters—Ed.

MISTAKEN IDENTITY

Several years ago, largely as a result of *Car and Driver*'s recommendation in the form of a Car of the Year Award. . . .

F.J. Reitter
Manhasset, New York

That's Motor Trend you're thinking of. We understand, by the way, that their Car of the Year issue is usually a sellout. Even when they have some copies left over—Ed. ●

Save Gas, Save Engine with 'POLY'

The following introduces one of the most fully tested and credentialed gas saving, friction reducing engine treatments ever to reach the market!

WHAT IS POLY? "Poly" is short for polytetrafluoroethylene (TFE). It is the slipperiest substance known to man **(1981 Guiness Book of World Records, p. 188).** The PetroLon Corporation, makers of Slick 50, has invented a way to permanently bind this slippery chemical to your engine with one treatment. All you do is add one quart of Slick 50 to your oil during oil and filter change. By reducing engine friction, Slick 50 increases gas mileage and horsepower and reduces engine operating temperature thus causing your oil and engine to last longer. Just as important, it reduces metal wear, defraying costly overhauls.

HOW DO I KNOW THIS ISN'T A FRAUD? Slick 50 has some very impressive credentials. The **"Consumers Digest"** magazine (March/April 1982, p. 35) states "Slick 50 does reduce engine heat and ordinary wear, and our informal tests indicate that it will improve gas mileage by about two or three miles per gallon.... Slick 50 does exactly what Petrolon claims it does." Researchers at a **nationally respected research laboratory**, after applying a powerful ultrasonic cleaning process to a Slick 50 treated engine part, were surprised at its permanence. They stated, "We actually expected the PetroLon Slick 50 TFE Resin coating to also be removed, but later found it was still there."

The **Federal Aviation Administration** has fully accepted a similar product- Slick 50 Aircraft Treatment (F.A.R. #33.49). An FAA test simulating 1400 hours of engine use (equivalent to about 70,000 miles on a car) showed almost zero engine wear!

"Dune Buggies and Hot VW's" magazine, April 1983, p. 70-71, records the results of their one year testing of Slick 50. "We can indeed say scientifically that Slick 50 does work and that it does reduce engine wear!.... for the price of one treatment when compared to engine rebuild, we feel you'd be money ahead using Slick 50." The senior engineering researcher at the **University of Southern California** in San Diego stated this, "Slick 50 does increase horsepower and decreases fuel consumption in tests done at the university." The **Space Shuttle Columbia** uses the chemical "poly" in its gears and bearings because it is the only chemical lubricant which can withstand the heat and corrosive elements of space.

Perhaps the most dramatic of all is a torture-test overseen by the **Automotive Services Council for Pennsylvania** and shown on television station WTVE. Three cars with between 75,000 and 129,000 miles on them were treated with Slick 50. Six months later the oil was drained from each vehicle and the cars were driven without the oil plugs for about a half hour. The water temperature never rose and the engines sustained no apparent damage. There are many more tests available. If you are still skeptical, send $2.00 to defray printing and postage costs and we will send you additional, more detailed, test information, etc.

HOW DO YOU TREAT AN ENGINE? Very simply. Just before oil and filter change, add engine flush (sent free with each order) to clean out your engine. Let your engine idle for 5 minutes. Then drain your oil, change filter and add the proper amount of oil less one quart. Add one quart Slick 50, drive for 30 minutes, and leave it in the crankcase for 3,000 miles. As the engine operates, the oil carries the "poly" between the parts where it is burnished into the pores of the metal. Once impregnated it is permanent, so **you do it only once**, not each time you change oil. One quart of Slick 50 will treat all standard 4, 6 and 8 cylinder gasoline and diesel engines.

WILL IT WORK WITH MOST OIL? Yes, Slick 50 will work with all petroleum based oils and all synthetics compatable with petroleum based oils.

WHAT ARE THE BENEFITS OF SLICK 50? Your actual benefits in percentages may vary, depending on the kind of driving you do, vehicle condition, etc. By reducing friction, Slick 50 does all of the following: it **increases gas mileage.** It **increases horsepower** -- small economy cars and large RV's really need this. It makes for **easier starting** (important in cold weather). It **reduces operating temperatures**, thus increasing the lubrication and life of your oil and your engine. Since lubricating lead is being removed from gas and unleaded gas is poor in lubricating qualities, the **extra lubrication of Slick 50 on valve stems and guides is very valuable.** Last, but not least, the drastic reduction in engine wear **defrays or eliminates costly overhauls** which can save you over $1,000. Slick 50 eliminates the "lubrication starvation" that all cars experience when first started before the oil has a chance to circulate. Up to 90% of the wear on a car can be caused by this lubrication starvation. You receive all of these benefits for **less than the cost of two tanks of gas** ($39.95).

WILL SLICK 50 HARM MY ENGINE OR AFFECT MY WARRANTY? No! Slick 50 is suspended in an excellent grade of petroleum oil which meets or exceeds every manufacturers engine warranty requirements. In addition, this oil carries an API (American Petroleum Institute) service classification SF-CC-CD.

DEALERSHIPS ARE AVAILABLE.

OTHER SLICK 50 PRODUCTS available are Gear Treatment (manual transmission, etc.), 2-Cycle Engine Treatment, Grease, Ultra 9 Oil, Fuel Conditioner, and Fabric Protector. Free information is sent upon request.

EASY TOLL FREE NUMBER. Since Slick 50 is **"too too Slick"** for engine friction, our toll free number is 1-800-22-SLICK (that is, 1-800-227-5425).

Free engine flush sent with each order. Free shipping with orders of 2 or more.

For purchase or further information call toll free 1-800-22-SLICK, (in Colorado, call 1-303-667-1715) or send to: FORT MORGAN SLICK 50, 407 Del Rio Road, Berthoud, Colorado 80513.

CD4

☐ I enclose $39.95+$4.00 shipping & hand.
☐ I want 2 or more (free shipping & hand.)
☐ Check ☐ C.O.D. ☐ Visa/MC

Card # _____ Exp._____

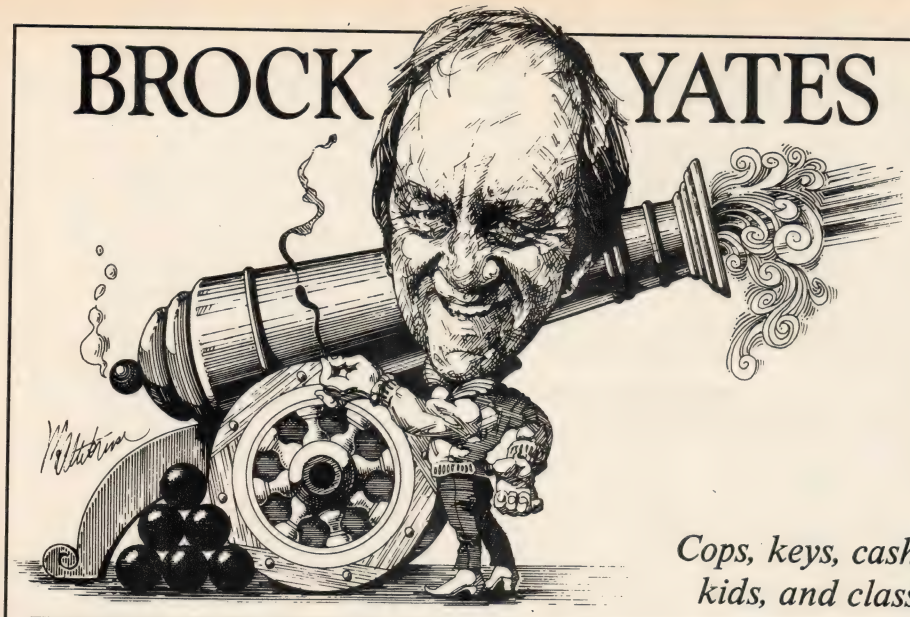
Name _____

Address _____
(Give street address for U.P.S. delivery)

City _____

State _____ Zip_____

BROCK YATES



Cops, keys, cash, kids, and class.

• **Justice triumphs . . . almost:** We extend our heartiest congratulations to the state of Connecticut for yet another highly successful anti-speed program. The governor of the Nutmeggers recently sent his state police onto the highways and byways in a fevered hunt for those dreaded sociopaths who violate the nation's beloved 55-mph limit. Now, following thousands of arrests and the expenditure of $500,000 of taxpayers' funds, we see what we have seen so many times before: the enforcement blitz has affected the accident rate not a whit. Says a spokesman for the Connecticut State Police: "We'd like to say that [the crackdown] has cut accidents, but it hasn't." What it did was inconvenience a lot of people, load the courts with senseless cases, waste refinery loads of fuel, and further embitter the citizens of the state toward their highway patrol.

The one positive note is that the latest effort wasn't as silly as former governor Abe Ribicoff's enforcement offensive of the late 1950s. That time, the accident rate in Connecticut *increased* each year.

Open-door policy: As we make great leaps forward in automotive technology, the simple act of unlocking a car door and starting the engine remains ossified in the past. Take, for example, the wonderful inconsistencies of our Big Three: General Motors uses the same keys that have been around since the end of World War II; they are inserted teeth downward. Ford uses newer, double-edged keys. Chrysler uses aged versions that go into their locks with the teeth up. Three different lock systems are employed in cars that have for decades been clonelike in concept and quality.

The better imports, including Honda, BMW, and Mercedes-Benz, use the eminently practical double-edged keys. Moreover, they use single-key systems, so one does not have to play memory games to recall which key works in the trunk, the glove box, or the door.

Now Chrysler has added an even weirder fillip to the confusion. Of course, its keys still go in upside down, and the lock mechanisms still feel about as precise as a Taiwanese Rolex, but now the ignition keys are mounted in heavy plastic, à la Mercedes and BMW. Going uptown, you say? Not quite. The fact is that the plastic contains a tiny resistor that is said to nullify the static charge of the metal part of the key, which could otherwise make the new video-game instrument panels go blooey. And dealers are selling replacements for $18 to $24, it is said. That's in the same league with a Mercedes key, which costs $25, or a Bimmer model, which comes complete with a tiny built-in flashlight. The Honda key? About three bucks.

Will that be cash or charge? As you know, the car biz was electrified a few months ago when pizza mogul Tom Monaghan bought a brace of Duesenbergs for two million bucks. But that princely outlay of cash may seem like fast-food small change to those in attendance at the upcoming Harrah's auction in Reno. There the world's greatest automobile collection is once again being split up by the new owners, cash-poor Holiday Inns of America, and it is believed that one of the two Bugatti Royales owned by Harrah's will go on the block. Although the Type 41 in question is far from the most desirable of the rare Royales (only six are known to exist), many expect that the sale price will be in the range of *eight million dollars.*

Crybabies: This magazine, being a sort of printed counterpart of the Los Angeles Raiders, has been the subject of agonized shrieks, Bronx cheers, and righteous denouncements throughout its long history. Such is the lot of winners, we say with no modesty intended, and therefore it was not surprising that a great wailing of wounded indignation arose after we commented in this column about the infuriating proliferation of those back-window signs that warn, "Baby on Board." Constant readers will recall that we admitted to an urge to rear-end vehicles displaying such fussy pretensions, and there were those among the million or so who read this august journal who took umbrage at our heresy and assaulted our lavish editorial complex with prodigious quantities of hate mail and outraged phone calls.

Although it puzzles us that some people fail to recognize hyperbole, yet still choose this magazine over its more mundane competitors, we will attempt to allay their fears: no, we would no more ram a car with a kid inside than we would ram one containing a Nobel laureate or the Vienna String Quartet. We simply object to the sanctimonious, slightly superior scolds who choose to tell the world that they are special by means of various automotive signboards. First Amendment rights notwithstanding, I don't have to like or care about the fact that somebody is a member of the National Rifle Association, loathes nuclear weapons, wants the U.S. out of El Salvador, or "loves" (with the obligatory heart) everything from Yorkshire terriers to Emporia, Kansas, to necrophilia. As for the "Baby on Board" nonsense, those who fear that their little darlings will be bunted into utopia by some brutish motorist should try a more forceful message: "Lyle Alzado on Board." We guarantee that the great unwashed will keep their distance.

And in place of the vinyl roof . . . you get a day with the likes of Brian Redman, Hurley Haywood, Bobby Rahal, and Elliott Forbes-Robinson. Brumos Porsche of Jacksonville, Florida, and Atlanta, Georgia, is one of the oldest and most famous car dealerships in the nation. Its founder, Hubert Brundage, created the Formula Vee class, and his successor, the late Peter Gregg, ranks among the greatest sports-car drivers ever produced in America (six IMSA championships, four SCCA Trans-Am titles). Gregg's widow, Deborah, and Brumos's longtime president, Bob Snodgrass, have carried on the Brumos name in high style, also selling Audis and Mercedes, as well as recruiting the famed Brian Redman to manage the Porsche operation in Jacksonville.

Now, when one has an all-time-great driver like Brian on the staff, one doesn't want him riding a desk. Therefore, if you buy a Porsche, new or used, from Brumos, you will get a free one-day driving lesson from Redman and company at the Roebling Road track outside Savannah, Georgia. Redman runs the school—which is keyed to high-performance road driving, not racing—and his pals Haywood, Rahal, EFR, et al., show up periodically to create a faculty of hot drivers unequaled anywhere else. So far, more than 200 happy customers have completed the school.

The whole deal, which Snodgrass swears is not added into the prices of the cars, is intended, in his words, "to raise the awareness of the Porsche owner with respect to his product." Overall, a wonderful idea that ought to be duplicated by other high-performance-car dealerships. All they need is Brian Redman. ●

One of the many examples of Ford's attention to detail is the cargo restraining net on the LX. It helps keep grocery bags from tipping over and loose packages from sliding around.

THE NEW FO
ITS PERFORMAN
TO WHAT'S UN

The mark of a well-designed automobile is total performance.

In the case of Taurus, that means a powerful 3-liter, V-6 engine. Plus dozens of other features that not on respond to the needs of the driver, but to those of the passengers as we

As a result, Taurus performs beautifully.

Even the smallest details have been carefully thought out. For example, the shape of this light switch and its position on the instrument panel make the simple task of turning on the lights as easy as possible.

The trip computer is part of the optional electronic instrument cluster. It provides valuable travel information such as rate of fuel consumption and the distance you can travel until empty.

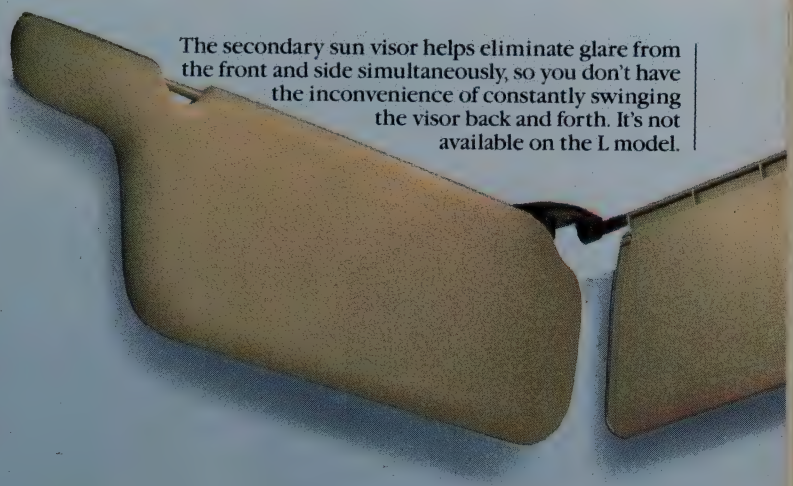
The optional electronic instrument panel is designed to be "user friendly." All instruments are easy to read and all controls are placed where your hands can easily find them.

RD TAURUS. CE ISN'T LIMITED DER THE HOOD.

Right down to the smallest detail.

The best-built American cars.

At Ford, Quality is Job 1. A 1985 survey established that Ford makes the best-built American cars. This is based on an average number of problems reported by owners in a six-month period on 1981-1984 models designed and built in the U.S.



The secondary sun visor helps eliminate glare from the front and side simultaneously, so you don't have the inconvenience of constantly swinging the visor back and forth. It's not available on the L model.

Have you driven a Ford...lately?

Ford

Buckle up—Together we can save lives.

Three cheers for the Volkswagen GTI.

It all started three years ago, when Car and Driver said the Volkswagen GTI was "...a cause for rejoicing..." As well as one of 1983's ten best.

"It's tough to imagine anything that delivers more pure, uncomplicated fun..." was how they put it in '84.

This year, you-know-who called you-know-what "...the most all-around satisfying car ever built...," and oh, yes—one of 1986's ten best. Hip, hip, hurray.

VW GTI

Seatbelts save lives.

FOR YOUR INFORMATION

BY ARTHUR ST. ANTOINE

NEW & IMPROVED

• Flash! **General Motors** intends to purchase **Lotus** lock, stock, and barrel. Major shareholders of Lotus have already approved the sale, and no problems are anticipated in buying up the company's publicly held shares. (However, Toyota, which has a small interest in the British company, is said to be very upset about the takeover.) GM has been the biggest customer of Lotus's consulting services during the last three years. Look for the introduction of Lotus's new X100 two-seater (which may be called the Elan) to be delayed for several months in order to allow the engineers enough time to substitute GM components for the Toyota powertrain pieces that had been planned.

• **AMC** is rumored to be searching for an **Asian partner** to produce cars or trucks, or both. Korean sources and the trade journal *Automotive News* report that AMC is holding talks with Donga Motor Company, Ltd., regarding 10,000 units of a joint-venture minivan. An AMC spokesman will say only that the company is interested in possible business arrangements with Asian companies. But insiders suggest that the Renault Espace van, currently in limbo, may never see duty in the U.S. at all if the Korean van deal is consummated.

• **Chrysler** will import the four-wheel-drive **Mitsubishi Pajero** beginning in the fall of 1987, according to Japanese reports. Currently sold as the Montero by Mitsubishi dealerships in the U.S., the spirited four-by-four will join a growing rank of small all-wheel-drivers at Chrysler, including a version of the new Dodge Dakota pickup and a pending downsized Ramcharger. A Chrysler insider says that the company intends to import at least 10,000 1987 Pajeros, beginning in the fall of 1986.

• **BMW** is said to be readying a new **V-12 engine** that is destined to be used in a new luxury coupe scheduled for a 1990 U.S. release. The front-engined, rear-drive two-plus-two is believed to be smaller than the current 6-series coupe and will offer ultra-high performance to match the competition from Stuttgart. The V-12 should appear first in a new 7-series sedan due for a late-1986 launch.

• The **Honda Accord/Vigor** has been named Japan's 1985–86 **Car of the Year** by a 61-member jury of automotive journalists and analysts. The refined Honda topped 43 other nominees by being voted superior in design, concept, performance, quality, and value.

• The Ford Taurus/Mercury Sable aero-mates have created so much excitement in the marketplace that General Motors has reportedly gone back to its **GM-10 drawing boards.** Though the new GM designs are almost locked in, slight appearance changes will be made to the GM-10 replacements for front- and rear-wheel-drive mid-sized cars from Buick, Chevrolet, Pontiac, and Oldsmobile.

• **Jaguar** is rumored to be thinking very seriously about building a **new sports car**—code-named XJ41—along the lines of the famous and fabulous E-type of old.

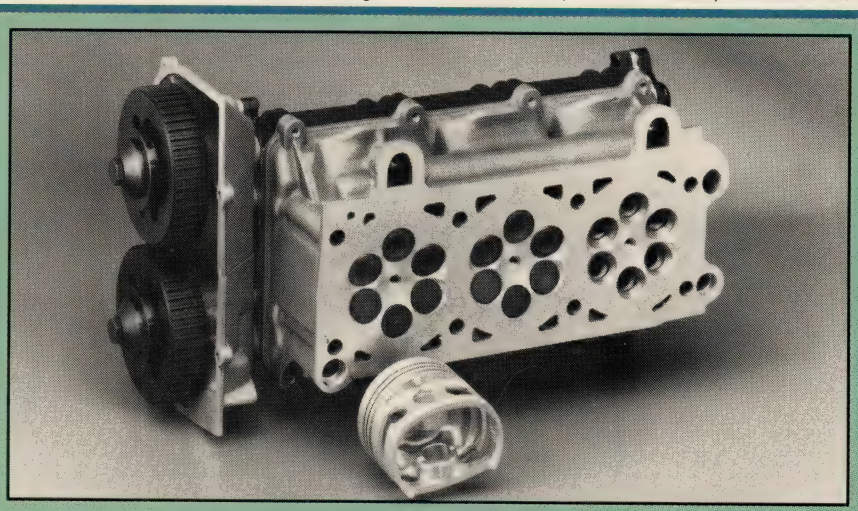
• Czech carmaker **Škoda** is said to be **eyeing the U.S.** as a possible market for its new front-wheel-drive car, which is scheduled to appear next year. The aged rear-drive Škoda will be replaced by a more modern small sedan, styled by Bertone and using many parts manufactured by British and West German companies. Production could be boosted above 200,000 cars a year if the export demand is strong.

• The latest list of the ten most **trouble-free cars** is dominated by imports, Toyota in particular. A recent J.D. Power & Associates questionnaire asked new-car buyers to list the number of vehicle problems they encountered within the first two to three months after delivery. Called the Initial Quality Study, the survey revealed that imports rate far above domestics in the percentage of trouble-free vehicles delivered, and that Toyota is far and away the industry leader. Listed from first to tenth, here are the big winners: Toyota Camry, Toyota Cressida, Toyota Tercel, Toyota Corolla, Honda Civic, Honda Accord, Mercedes-Benz

'HIDDEN IMAGE'

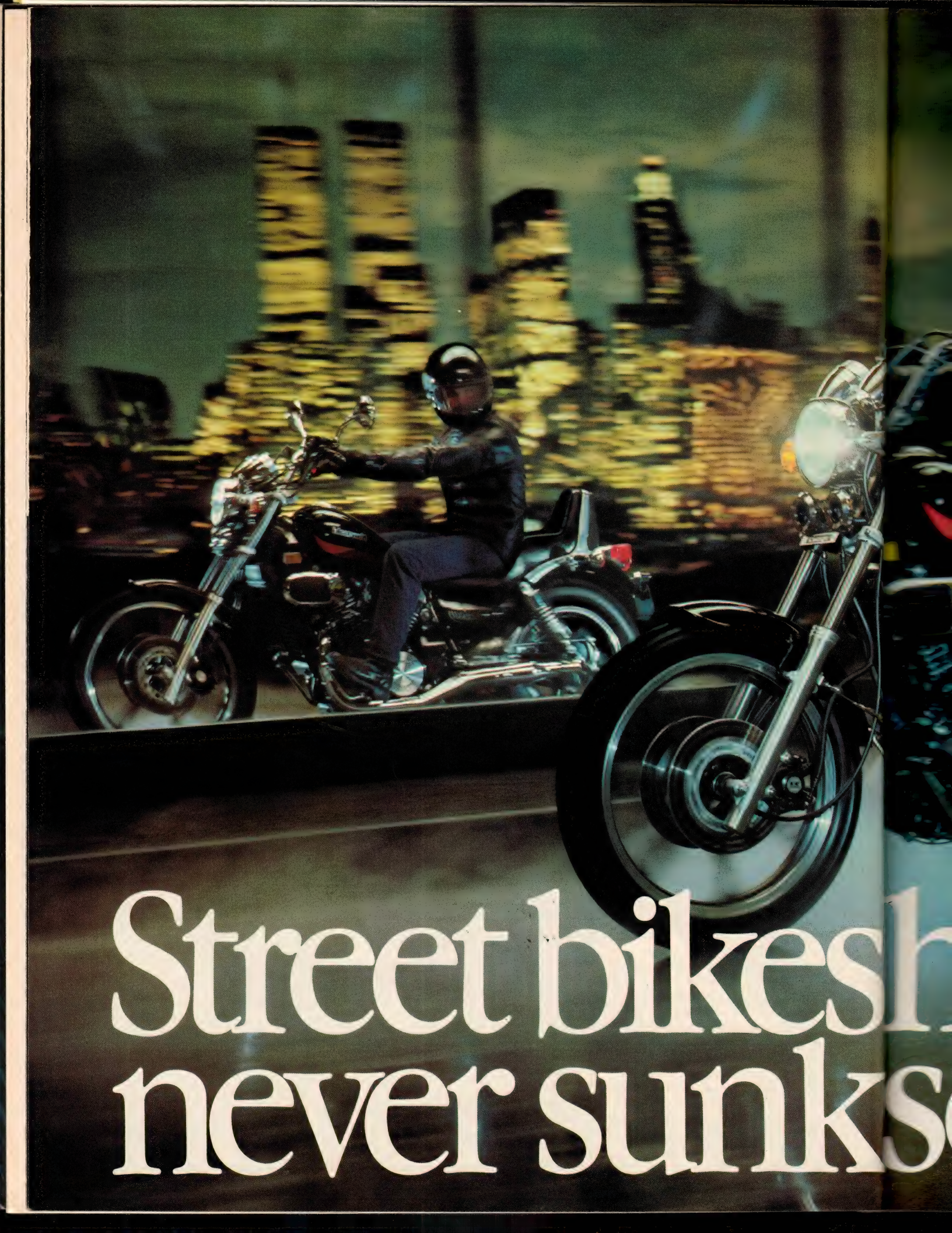
Spotted! Ford Mustang III?

Though reliable sources will confirm only that this smooth coupe is either the redesigned Mazda 626 or the upcoming Mazda-built Ford Mustang III, an examination of its grille and headlamps indicates to us that it's the Mustang. Mazda plans to build the Mustang III for Ford in its brand-new Flat Rock, Michigan, facility beginning in 1988.



Heavy Breather!

A pair of these exotic six-valve-per-cylinder heads will soon be mated to Maserati's V-6. The 2.0-liter, twin-turbo, dual-overhead-cam engine is rated at an impressive 257 hp at 7200 rpm and operates with twelve pounds of boost pressure. Each cam lobe actuates a group of three inlet or three exhaust valves via a patented three-pronged finger follower. Expect the healthy powerplant to see duty first in a brand-new Maserati two-seater, which the company is expected to announce later in the 1986 model year.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380, Toyota Celica, Mercedes-Benz 500, and Toyota Supra. Of the top twenty vehicles on the list, only two are bona fide American designs: the Chevy Citation II (which is now out of production) and the Ford Crown Victoria.

TECHNOID

• **General Motors** is at work on an ultra-lightweight, high-output engine that will make use of lightweight metals such as aluminum and magnesium, as well as ceramics, according to industry sources. Dubbed the **Manhattan Project** after the code name used for the development of the first atomic bomb, the new engine will use ceramics to reduce weight and retain heat energy normally lost through the cooling system. Also, since ceramics are extremely hard, less engine wear and the possible elimination of some or all of the lubrication system could result. The all-new powerplant may first appear in the 1991 Camaro and Firebird.

• Yesterday's technology tomorrow: the **continuously variable transmission** is once again on track now that stricken CVT-belt producer Van Doorne has been put back on its feet by the Dutch government and the electronics company Philips. With the required steel belts now available, automakers can resume CVT production plans. Subaru will begin this spring, and should have a shiftless transaxle available in its Justy model later this year. To avoid competition for the steel belts, Subaru will be supplied with belts for cars with engines below 1.2 liters, Ford and Fiat with belts for 1.6-liter vehicles, and GM with belts for 1.8-to-2.0-liter cars.

• **Four-cylinder engines** were installed in **more than half** of all U.S.-built cars for the first time in 1985, according to a study reported in the industry journal *Ward's Automotive Reports.* The study concluded that 52 percent of 1985-model-year American cars—or 4.32 million units—were equipped with four-bangers.

• Radar-detector devotees, take note: the **InstaClear** windshield available as an option on the new Ford Taurus/Mercury Sable will significantly weaken incoming **police radar** signals, effectively reducing the performance of a modern dash-mounted superheterodyne detector to the level of an obsolete passive unit. The ultra-thin silver-and-zinc-oxide layer applied to the windshield to conduct defrosting current reflects a large portion of the radar signal. For those who want both a detector and an InstaClear windshield, a remote-mounted unit is one solution (*C/D,* March 1985), though remotes are less effective than dashboard detectors mounted behind standard windshields.

Ford Sierra RS Cosworth

Power shopping at the race-car store.

• Imagine a three-door sedan with the performance of a Ferrari. A racing car, but not a sterile, uncivilized brute that needs a mechanic to start it in the morning. A racing car with all the options of a well-equipped sedan built in, from anti-lock braking to power door locks to electric windows. Combine all this with a 150-mph top speed and a 0-to-60 time of less than seven seconds, and you've got the Ford Sierra RS Cosworth.

The Sierra Cosworth was born of Ford's desire to have a competitive model in Group A sedan racing. Last year Ford won the British national championship with a Sierra powered by the four-cylinder turbo motor of its U.S. sister, the Merkur XR4Ti. The new car has been developed in England by Ford's own Special Vehicle Engineering group in conjunction with the world's most famous race-engine constructors, Cosworth of Northampton. To qualify the car for Group A racing, 5000 homologation examples designed for street use must be built. Cosworth is assembling the 2.0-liter, twin-cam, sixteen-valve, turbocharged four-cylinder engines, and Ford will construct the cars at its Genk, Belgium, assembly plant.

The basic structure of the RS begins with the simplest and lightest Sierra body shell available: the three-door, four-side-window version used for the slow-selling base model. It is well disguised, though, by a new front end, incorporating an extra-deep spoiler and air ducts, by extended wheel arches and rocker panels, and by an enormous rear wing mounted halfway up the rear window. If it's needed for racing, it has to be on the road car.

Actually, a car of this performance level, even in its 200-hp roadgoing trim, truly needs its aerodynamic assistance. SVE engineers say that the rear wing generates up to 50 pounds of downforce at speed.

Because the RS is being made on regular production lines, chassis changes are modifications of existing components rather than complete redesigns. The RS gets stiffer springs and shocks, a thicker front anti-roll bar, and wider (7.0-by-15-inch) wheels, wearing the latest German Dunlop D40 50-series tires. The most important development for precise wheel control is the substitution of solid nylon bushings for the rubber pivots used in the standard Sierra suspension.

We were allowed to test-drive several pre-production models, each fitted with the Sierra's regular variable-rate power steering. Some changes for the final cars may be in order, as these early editions felt disconcertingly nervous as they turned into corners. Their ultra-sharp steering response will be familiar to those with competition-car experience, but may be too unforgiving for many of the business executives at whom Ford is targeting the bulk of its homologation run.

Any lucky soul who manages to grab an RS Cosworth for himself is in store for plenty of thrills, because this car is *fast.* Our preview was held on the plains of Spain—mostly on long, straight, single-track roads—and 150 mph came up on the speedo time and time again. A few short years ago, this kind of speed was attained only by the hottest of supercars during white-knuckle testing on empty autobahns at dawn. The Sierra RS Cosworth makes it an everyday affair in what is essentially still an ordinary sedan.

Its twitchy steering and a you-better-hold-on liveliness under hard braking aside, the RS handles beautifully, and its roadholding is good. Traction is aided by a smooth-acting viscous-coupling limited-slip differential. It is also reassuring to see that the RS has been fitted with the largest brakes that will fit into its fifteen-inch wheels—complete with four-piston calipers and the same anti-lock braking system that is standard on the Ford Scorpio.

Surprisingly, the tight suspension, though harsher than a standard Sierra's, does not produce an unacceptably hard ride. Perhaps even more remarkable is the engine's docility. It starts at a flick of the key, and with only a whispering hint of that Cosworth growl and whine. It will trundle around town without complaint and respond when called upon with scarcely a trace of turbo lag.

Manufacturer: Ford Motor Company, Ltd.
Brentwood, England
Vehicle type: front-engine, rear-wheel-drive, 5-passenger, 3-door sedan
Price (U.K.): $24,000
Engine type: turbocharged and intercooled 4-in-line, iron block and aluminum head, Weber-Marelli fuel injection

Displacement	122 cu in, 1993cc
Power (DIN)	201 bhp @ 6000 rpm
Transmission	5-speed
Wheelbase	102.7 in
Length	175.5 in
Curb weight	2750 lb

Sadly, none of the 5000 homologation specials is earmarked for the U.S. But if the demand is there, Ford seems willing to make some more. Indeed, a second-generation Sierra Cosworth is in the works, and it could boast even more performance. Ford of Europe vice-chairman Walter Hayes has a dream of fitting the new car with a version of the turbocharged Cosworth V-6 Formula 1 engine that will make its first appearance in the Beatrice Grand Prix car this season. Here's hoping. *—Ray Hutton*

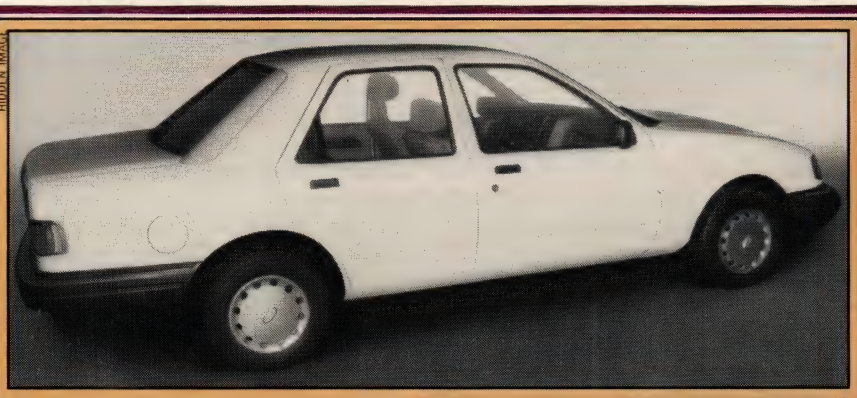
CASH FLOW

• **Austin Rover** and **Peugeot** have formed an unlikely alliance to sell cars in **Japan.** The British company has set up Austin Rover Japan to sell its own products there—notably the new Rover 800 (originally dubbed 600 but changed to prevent confusion with BMW models), which, conveniently, will be built by partner Honda. Austin Rover's Japanese arm will also sell the Peugeot 205 in several models. The partnership grew out of a link between the two companies in Australia, where Austin Rover assembles Peugeot 505s.

• **Nissan** plans to sell the upcoming low-priced, Malaysian-built **Proton Saga** through its affiliates in Japan and will also supply parts for the car's production. The move was prompted by Malaysian import tariffs, which are expected to reduce sales of Nissan Sunny (Sentra) models in Malaysia; by providing parts for the Saga, Nissan hopes to offset lost Sunny sales. Toyota and Honda, rather than compete directly with the Saga, will focus on selling upmarket models in Malaysia.

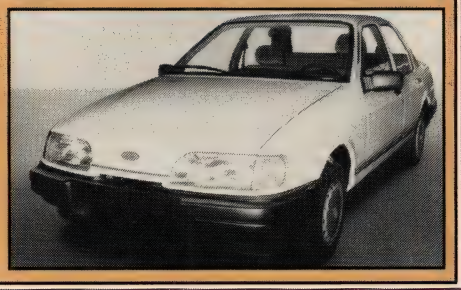
• U.S. **car and truck sales** last year rose about eight percent over 1984's level of 14.5 million units. In spite of the widespread use of incentives late in the year, the total sales did not top the 1978 record of 15.4 million cars and trucks. Nor did 1985's total of 11.0 million cars exceed the 1973 record of 11.4 million.

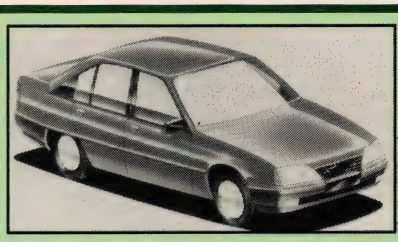
• Chrysler is talking with **Romanian** officials



Slick Sierra!

Here are the first photos of the restyled Ford Sierra, due for release in early '87. The Sierra will add this notchback version to the existing hatchback and will also receive Scorpio-type flush headlights and a new bumper treatment. The revamped nose could well appear on the U.S.'s own Merkur.

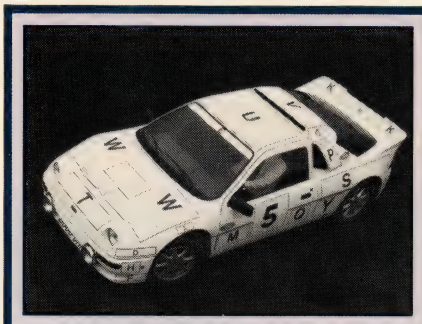




This drawing depicts what will likely be the final version of the new Opel Rekord when it debuts this fall. The car is said to have four-wheel independent suspension and engines from 1.8 to 2.2 liters, putting out 90 to 130 horsepower.

about the possibility of producing its **minivan line** in that country. Also on the discussion table is the possibility of bringing a Romanian-built Citroën model to the U.S.

• For the first time in Japan, cars of **different makes** are being displayed in the **same showroom**. Nihon Rent-a-Car has opened a showroom in Tokyo called Freeroad wherein two cars from each of seven manufacturers (Toyota, Nissan, Honda, Mazda, Mitsubishi, Isuzu, and Subaru) are displayed. Customers can receive a full range of vehicle information without having to travel from one dealer to another. Freeroad also allows customers to rent cars similar to those on the showroom floor.



No, this Ford RS200 rally car is not sponsored by the makers of Scrabble. Similar photos will be used in marketing surveys to determine which letters people remember best, and therefore which spaces should command the most money from sponsors.

MOVERS & SHAKERS

• AMC president and CEO Jose Dedeurwaerder has been elevated to **executive vice-president** of Renault, responsible for worldwide sales and marketing. While retaining his current duties at AMC, he will maintain homes in both the U.S. and France. Renault owns 46.1 percent of AMC.

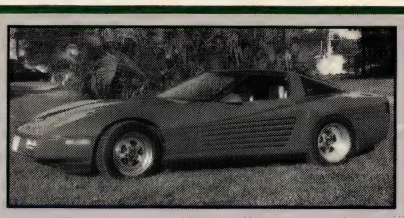
• Mazda Motor Corporation president **Kenichi Yamamoto** has been named Man of the Year by *Chilton's Automotive Industries* magazine.

SAFETY FIRST

• Big **tractor-trailer rigs** have recently come under fire from the Insurance Institute for Highway Safety. A study was undertaken by the institute to see what improvements could increase road safety for trucks. Among its findings: in a fatal car-truck crash, the car occupant is 35 times more likely to be killed than the truck driver; trucks can take two to three times longer to stop than cars, and many big trucks have had their front brakes removed; and one of every three tractor-trailers can be expected to crash in a year. Some of the institute's proposed solutions: speed-limiting devices on all trucks to lessen the danger of brake failure; upgraded tires for trucks and the prohibition of recapped front tires; mandatory power steering for better control when tires blow out; and anti-lock brakes for skid control.

GAS PAINS

• The six-cent-per-gallon **tax break** on gasohol could cost the U.S. highway trust fund **half a billion dollars** by 1990, reports *Automotive News*. Gasohol was granted the tax break by the Congress in order to increase its use, but now that the EPA is reducing the amount of lead allowed in gasoline, gasohol is becoming more widely used by many gasoline marketers. Gasohol, a mixture of 10 percent ethanol and 90 percent gasoline, could account for 25 percent of total U.S. gasoline sales by 1990. If the tax breaks continue, the revenues earmarked for highway construction and repair could be cut severely.



First it was Tubbs and Crockett zipping all over Miami in a Corvette in Daytona clothing. Now along comes this latest Corvette in Ferrari garb: the Eurovette, from Special Edition Corvettes, Inc., of Clearwater, Florida. Bring in your Corvette and about $10,000, and you too can add a little "Vice" to your ho-hum life.

JUSTICE, ETC.

• More than 8000 **speeding tickets** issued by state police near Connecticut Turnpike tollbooths in recent weeks could be **invalid** because the speed-limit signs there are the wrong shape and color, reports Electrolert's newsletter, *Monday a.m.* The signs placed before the tollbooths are orange, diamond-shaped advisory signs of the type usually seen near construction zones. Motorists caught speeding in advisory zones are usually fined for reckless driving but not for speeding.

U-TURNS

• Japanese-only road signs are **disappearing** from Japan, reports the *Wall Street Journal.* Beginning a five-year program to print signs in both Japanese and English, the Japanese government hopes to have all signs in the Tokyo area converted in time for the May summit meeting of Western leaders.

• The *Times* of London reports that a reader spotted this sign near a bridge over the Shag River in **New Zealand:** "Bridge Dangerous When under Water." Another *Times* reader reports seeing this encouraging sign in northern England: "Dangerous Bridge under Construction."

• The *Times* also reports this story: A man **crashed** his car into one of Britain's motorway bridges at a speed of 70 mph. He managed to get out, then proceeded to stagger over to an electricity facility, where he climbed a 132,000-volt power pole and then fell to the ground in flames. After the flames subsided, the man bumped into an employee of the facility, who asked him what he was doing. The man replied that he had gone out with the intention of killing himself, but had decided to give up.

QUOTES

• **Gerald Greenwald**, chairman of Chrysler Motors, is worried that U.S. automakers may lose a substantial portion of the car market this year. In a speech to the Detroit Economic Club, Greenwald listed Korean imports, restriction-free Japanese competition, and U.S.-built foreign cars as the biggest threats to the domestic industry. After concluding that Detroit automakers could lose about ten percent of their market share, Greenwald predicted that "somebody's blood is going to spill on the floor this year."

• Dallas psychic **John Catchings** recently told the *National Enquirer* that "Japanese automakers will develop an amazingly dependable car that sells in the U.S. for just $2000. It'll quickly become the biggest-selling car in America." Personally, we think the biggest seller is bound to be the $1999 Lamborghini Countach.

FYI is written with the assistance of contributing editors Daniel Charles Ross in Detroit, Anne Hope and Ray Hutton in Europe, and Yasushi Ishiwatari in Japan.

Mazda Familia Turbo GT-X 4wd

Four-wheel drive gets a full-time job.

• It goes without saying that four-wheel drive offers some benefits in traction and car control, and so it is not surprising that this powertrain configuration is rapidly becoming the in thing in Japan. Despite the sheer number of four-wheel-drive vehicles produced there, however, Japan has never had a full-time four-wheel-drive car in its domestic lineup—until now. Following in the footsteps of the successful Audi Quattro, Mazda has made the jump to full-time 4wd with its recently upgraded Familia sedan.

Mazda hopes to inject some adrenaline into the flagging sales of the Familia (dubbed 323 in the U.S.) with this revamped model. Currently, the only Familia body style available with 4wd is a three-door hatchback powered by either a 70-hp, 1.5-liter four-cylinder or a turbocharged, 140-hp, 1.6-liter four. Both engines are mated to five-speed manual transmissions. For our evaluation, we had little trouble deciding on the Turbo GT-X version. The sportier engine would put the chassis to a more strenuous test, we felt.

The newly developed engine is based on the same powerplant found in Mazda's B2000 truck. For duty in the Familia, it is beefed up with twin cams and an aluminum sixteen-valve cylinder head. The valves are actuated by hydraulic lash adjusters for maintenance-free running. The sixteen-valve head alone is a performance enhancer, but Mazda has generously also added a turbocharger and an air-to-air intercooler. Turbos have been widely used in this Japanese car class, but Mazda is the first manufacturer to add an intake-tract heat exchanger. The 1.6-liter engine develops 140 hp at 6000 rpm and 137 pounds-feet of torque at 5000 rpm—putting it on top of the performance list for powerplants of its size.

The Familia is the world's first vehicle with full-time four-wheel drive to use a transversely mounted engine. In order to save space, the center differential is an epicyclic-gear design. The torque split is 50/50 front/rear, and the central differential can be electrically locked from the cockpit when necessary.

The Familia's suspension features struts at all four corners, and the GT-X model also adds an air bladder atop each strut for two levels of automatic height control. Power steering is standard, and four-wheel disc brakes (vented in front) provide plenty of stopping power.

From a standing start, the four-wheel-drive Familia catapults forward with no noticeable wheelspin. Obviously, spreading the driving thrust over four tire patches plays a great part in its off-the-line quickness, but much is also owed to the turbo engine's strong delivery of low- to midrange torque; more than 90 percent of the maximum torque is developed between 2500 and 5900 rpm. And in contrast with many turbo engines, this one's power delivery is

YASUSHI ISHIWATARI

relatively linear, though it does produce a lot of noise above 6000 rpm. Nonetheless, the tach needle will reach 7000 rpm without fuss before it is stopped by a rev limiter.

We did much of our driving of the Turbo GT-X on a road with shaded damp sections, wet fallen leaves, and sunlit dry areas. This provided us an excellent variety of surfaces on which to try out the Familia's four-wheel-drive handling characteristics.

On dry roads, the Familia displayed unusually quick turn-in for a four-wheel-drive car, and there was a surprising lack of understeer at the cornering limit. As would be expected with any four-wheel-drive car, the Familia's straight-line stability was excellent.

Manufacturer: Mazda Motor Corporation
Hiroshima, Japan
Vehicle type: front-engine, four-wheel-drive, 5-passenger, 3-door sedan
Price (Japan): $9400
Engine type: turbocharged and intercooled 4-in-line, iron block and aluminum head, fuel injection

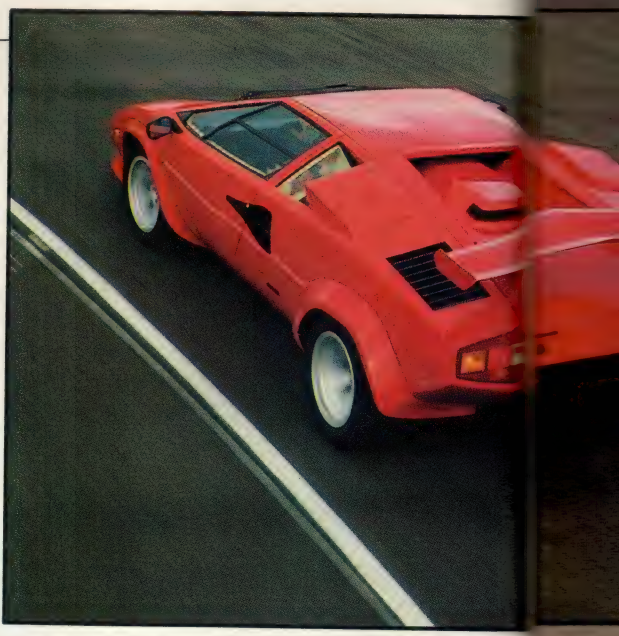
Displacement	97 cu in, 1597cc
Power (JIS)	140 bhp @ 6000 rpm
Transmission	5-speed
Wheelbase	94.5 in
Length	157.1 in
Curb weight	2400 lb

The damp, leaf-covered sections of our test course, which could have been a handful for a two-wheel-drive car, posed no problems for the Familia. Locking the center differential seemed to provide a good dose of extra stability. In fact, our only real complaint with the Familia is its lack of anti-lock brakes. With so much traction available, they would be a welcome addition.

The four-wheel-drive Familia won this reporter's heart after a brief exposure, and it also earned my vote for Japan's Car of the Year award. The 323 version should win more hearts when it arrives in the U.S. during the 1987 model year. In fact, the four-wheel-drive Familia is so good that I am seriously considering purchasing one to fill in during those times when road conditions make using my Renault 5 Turbo a problem. If only I could find a set of add-on fender flares for it . . . —*Yasushi Ishiwatari*

Lamborghini Countach 5000 Quattrovalvole

Welcome the big red vacuum cleaner.



• Well, here it is again, folks: the face that broke a million hearts. The four-wheeled pancake that's glamorized every car-mag cover in the Western world. The road-sucking Hoover that's vacuum-cleaned countless fantasy highways and ignited endless rumors but, to this day, remains clouded in mystery and myth. Say "Happy Birthday" to the Lamborghini Countach. It turns fifteen this year.

Any car that reaches this landmark deserves the full cake-and-candles treatment, but in the Countach's case there is more to celebrate than just a passage into old age. The most powerful Countach ever is now legal in the eyes of the U.S. government. The EPA has certified its breath, and NHTSA has signed off on its crashworthiness. This year, if all goes according to plan, 75 lucky rich people will be able to walk into Lamborghini dealerships in the U.S., plunk down 122 big ones, and drive their new Countaches away—just as if they were real cars.

Of course, the Countach isn't a real car. On the one hand, it's a toy with way too many zeros on the price tag. On the other, it's something else entirely. The Countach is an important historical automotive artifact, but one that's still making waves.

Consider, if you will, the significance of a car's surviving for a decade and a half. Even if you don't count the three years between the debut of the prototype and the first delivery, you're still talking about a twelve-year run. The normal life expectancy of most new models these days is five or six years—eight at the outside. The standard story line is that the design gets old, the buyers grow disenchanted, and it's off to the big crusher in the sky. Not so for the Countach.

Next, recall if you can the look and feel of the cars available anywhere in the world back in 1971. Now insert the Countach into that scene. Suddenly, a shark is loose in the minnow tank.

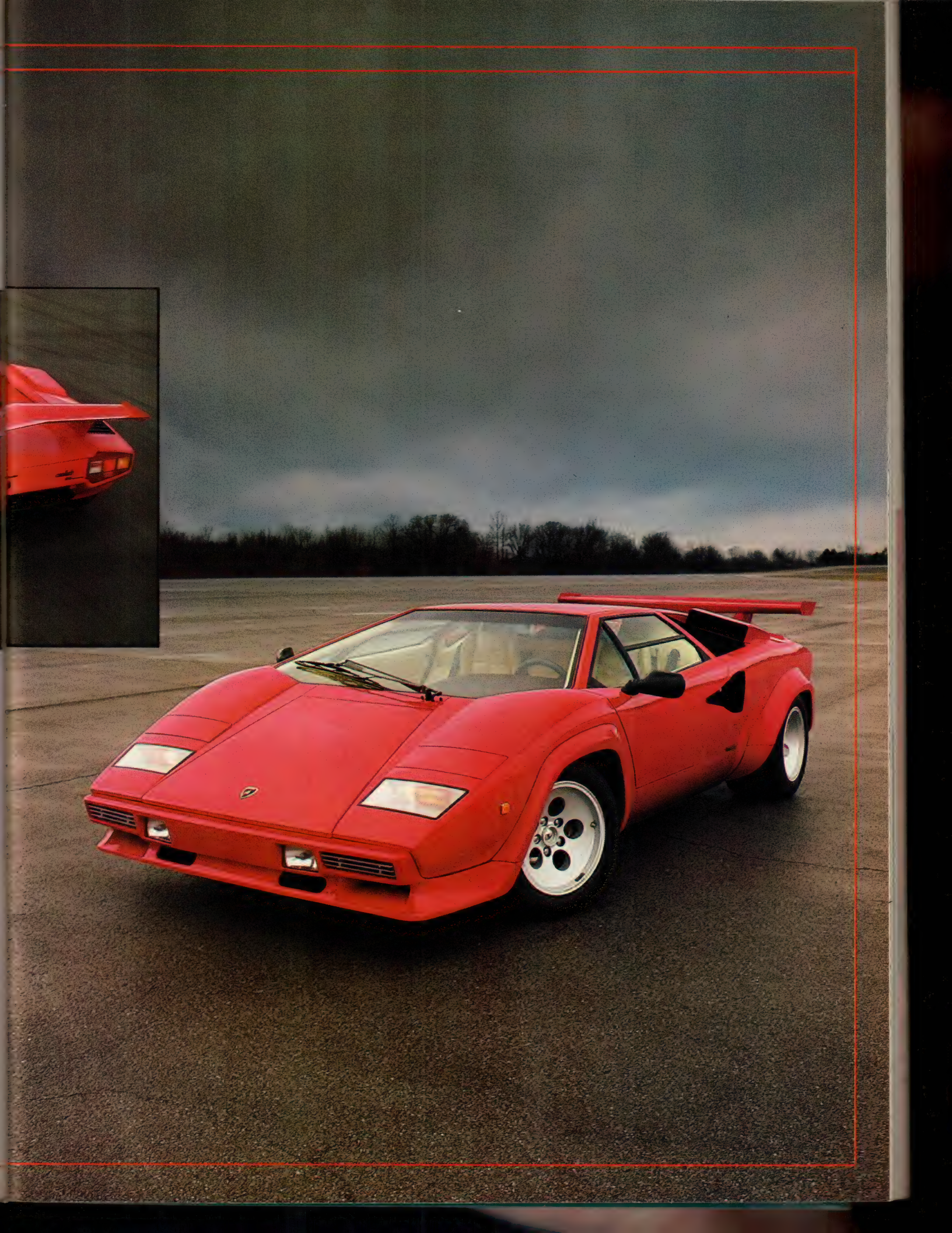
When the Countach was unveiled at the 1971 Geneva Auto Show, it set the world on its ear. It was never considered beautiful in the traditional sense. Then, as now, the Countach looked mean and military, an F-15 in a world full of Piper Cubs. Back then it relegated your average Mercedes to soap-cake-with-windows status. A Chevelle SS was a circus wagon by comparison. Thanks to Nuccio Bertone and his company, automotive design rocketed into the moonshot era. Even now, it's not clear that the rest of the world has caught up.

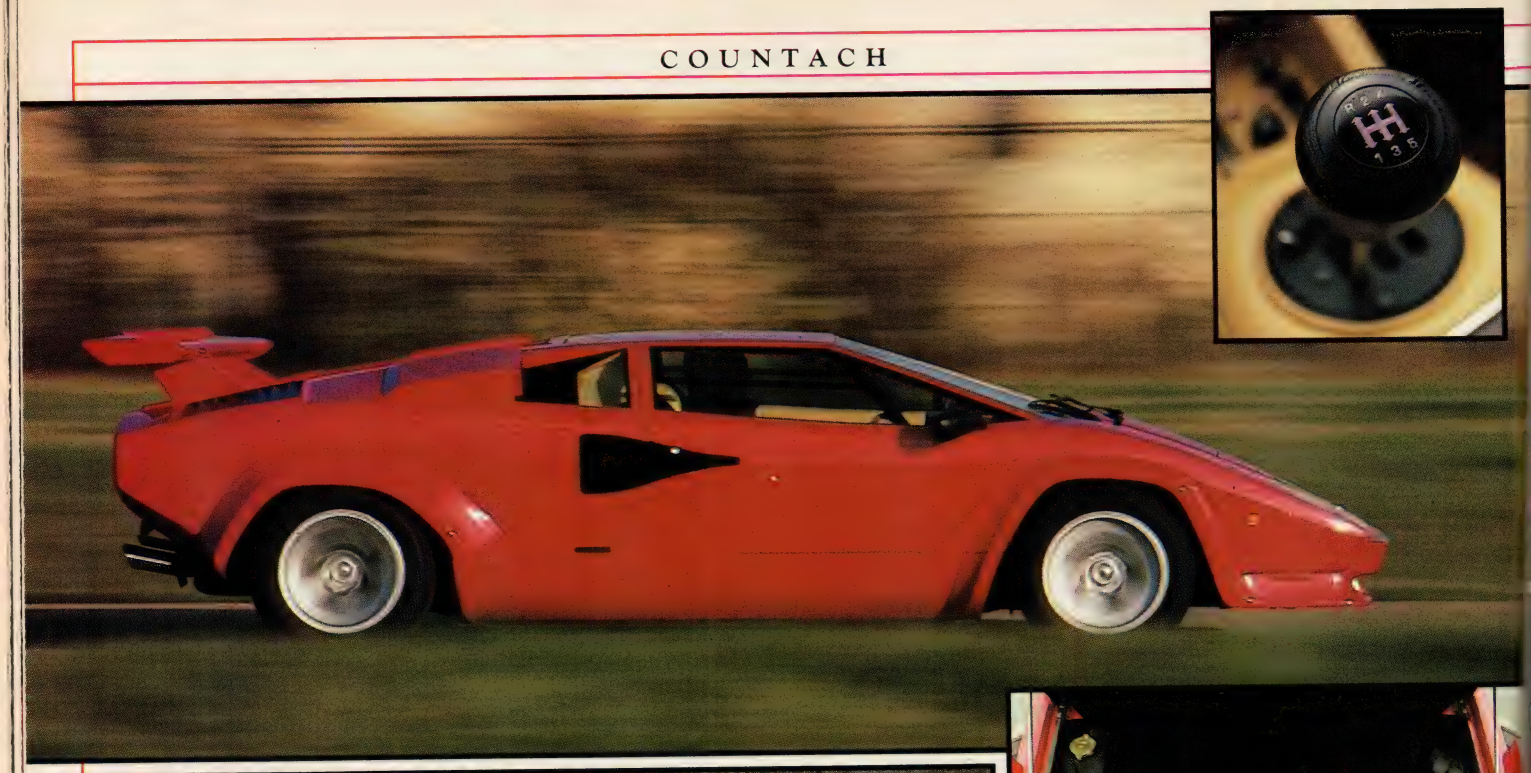
The myth and mystery come in when you shift your attention from the Countach's mesmerizing body to its vital statistics. Ferruccio Lamborghini dictated from the outset that the Countach would be the world's fastest production automobile, and for years no one knew for sure if it really was. Horsepower figures for the four-cam V-12, which grew over the years from 3.9 liters to today's 5.2 liters, varied all over the lot. Prodigious top speeds were reported by factory test drivers. (One claimed in print to going 185 mph routinely.) An unsubstantiated top-speed estimate of 192 mph by a leading U.S. car magazine only fueled the fires.

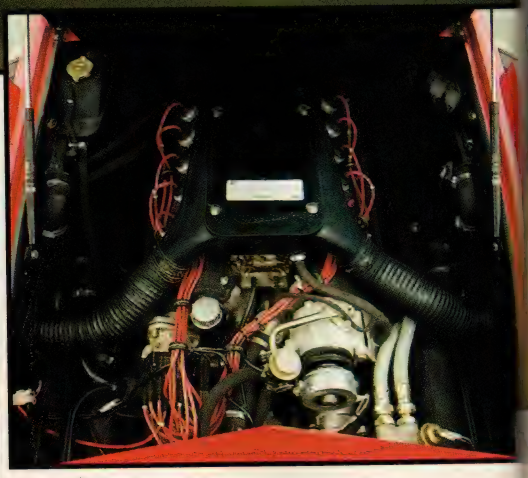
Despite our own sobering road test in December 1983, where a European-specification 5000S with a 4.8-liter engine topped out at a mere 160 mph (150 with the rear wing in place), many enthusiasts remained convinced. The Countach, they believed, was the biggest, baddest, and fastest vacuum cleaner of them all. So much for the power of the press.

Good PR was never the Countach's problem. Any exoticar that can overcome the stigma of sharing its name with a line of

PHOTOGRAPHY BY AARON KILEY







Necessary additions to the American Countach (above and left) include side-marker lights, bumpers, and a pair of fuel-injection systems.

Italian farm tractors and heating-and-air-conditioning equipment—the two businesses in which Mr. Lamborghini made his fortune—ought to have clear sailing in the marketplace. Nonetheless, the Countach's life story has been one long fight for survival. Not until 1974, three years after its Geneva debut, did it reach production. The same year, Ferruccio Lamborghini sold his interest in the company that he had founded in 1963 to "build a GT car without faults."

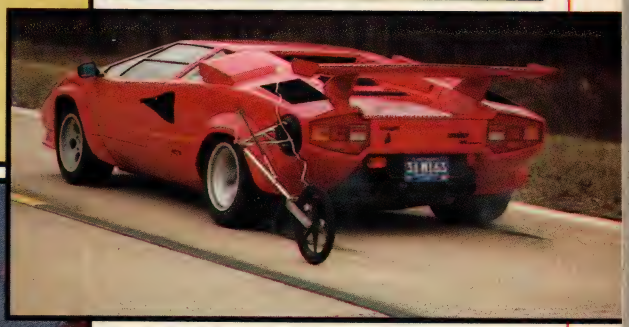
The new owners quickly found themselves in deep water. Labor unrest and poor planning dragged the company down. Production fell. Only sixteen cars were built in 1978, and there were no formal plans to certify the Countach for U.S. sale. Lamborghini was teetering on the verge of collapse, so the Italian government took control.

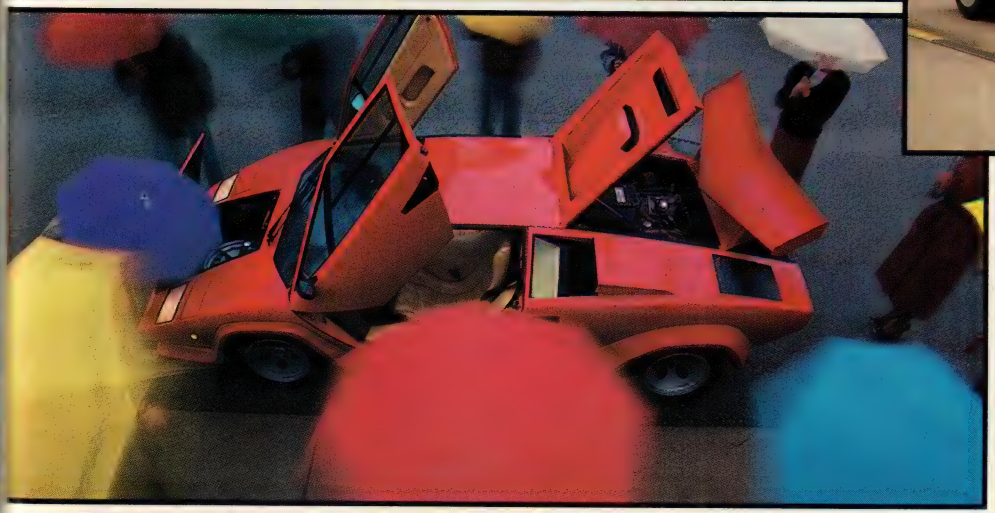
A year later, in 1979, a revised, wide-tired S version of the Countach was developed. Production continued to stagger along, however. But then the Mimran brothers, a pair of wealthy Swiss industrialists with a soft spot for the snorting-bull marque, bought the whole kit and caboodle.

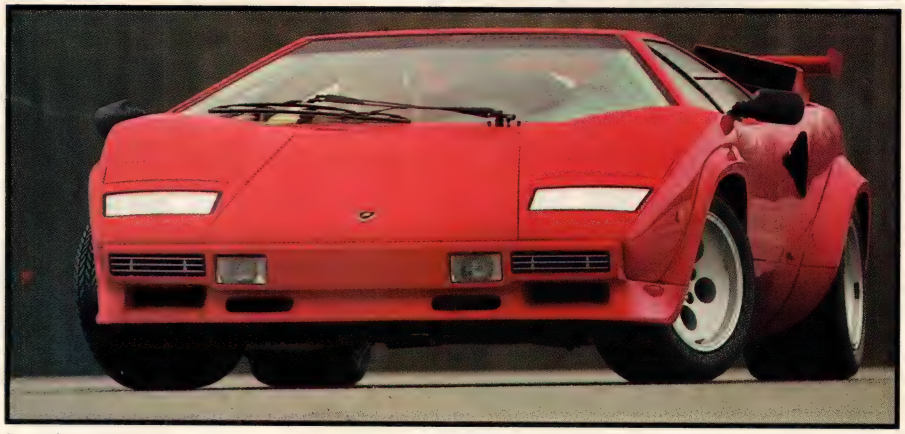
Since grabbing the reins, the Mimrans have been working hard. The 4.8-liter Countach 5000S hit the road in 1982. The promise to certify cars for the U.S. was carried out in 1984. The factory has also attempted to shore up the faltering dealer body, though the situation today seems as unsettled as ever. One thing *is* clear: for 1986, the Countach shoulders into the exoticar ranks with 5.2 liters of displacement and 48 valves to feed its twelve hungry cylinders.

All of this talk of the Countach's sordid past and historical significance is food for thought just as long as you can't get your hands on the real thing—which for most of us means forever. However, we guarantee you that if a real live Countach so much as rolls across your field of vision, you won't give a hoot in Houston whether its past is checkered or pinstriped.

Fifteen years after the first set of aluminum body panels was pounded into shape and dropped onto its tube frame, this car can still burn holes in your retinas. Seeing one on the pages of a magazine is one thing, but out in the real world, with cars and people and buildings to supply scale and perspective, something magic happens. The sight of the red test car rolling into the *C/D* lot cleared this office in record time. Out on the road, other drivers act like lost puppies, sniffing your heels and following you home.







When the question-and-answer starts, the Countach's pulsating presence is on your side. If you tell the uninitiated that it will do 200 mph, they'll believe you. A few might even swallow 215. Something this bad might just do it.

So how fast *does* the be-all and end-all of Countaches actually go? This was our best chance ever to clear the air, because we were in command of a nearly fresh European version, the one with the most powerful engine.

This particular car had an especially interesting story to tell. Owned by GM, it was graciously handed over to us by our friends in the Corvette development group. It had been bought solely to generate braking data used in recent ads touting the 1986 Corvette's anti-lock brakes.

For good measure, we also spent time with a U.S.-spec version, which differed in being fitted with fuel injection, emissions gear, and the required bumpers and safety equipment. The U.S. calibration drops the horsepower from a whopping 449 to a still-whopping 420, hardly enough to make much difference.

Aside from the new 48-valve engine, little about the Countach has changed since we slipped one on about two and a half years ago. Its cabin still pinches you, its acceleration still brings forth involuntary "oh wows," and it's still hardly a car that anyone would want to use as daily transportation.

The doors swing dramatically skyward like railroad-crossing gates, and, once inside, there's no question that this car was designed from the outside in—and a long time ago. Despite the long seat travel and the adjustable steering wheel, you really can't get comfortable. The huge front wheelhouses leave barely enough room for your feet. Six-footers will find they can't slip a credit card between their scalp and the roof.

Our test car's tan leather interior hides were sensational, but the rest of the cabin

design is a good twenty years behind the exterior inspiration. The switch gear is confusing and poorly placed, the door panels are featureless, and the separate heating and air-conditioning systems are antediluvian. The split door glass rolls down only enough to slip a Wendy's single through; if you want a double, you're out of luck.

Once you get acclimated to the race-car-low driving position, the heavyweight control efforts, and the park-by-ear rear visibility, though, you'll never leave this car's throttle alone. The Quattrovalvole is the perfect example of how power corrupts. One taste and there's no going back to life with a four-cylinder car.

The Countach's gas pedal has a lot of travel, and every bit of it counts. This car jams your torso into the seat like a 911 Turbo but delivers the part-throttle squirt of a big American V-8. The European model clicked off a searing 0-to-60-mph time of 4.5 seconds with no histrionics, and a quarter-mile in 12.8 seconds at 111 mph. The U.S.-spec car is only a tick slower (see test results). Put your foot into it anywhere at any time and the 48 valves are ready with a full-throated V-12 battle cry. Pure satisfaction.

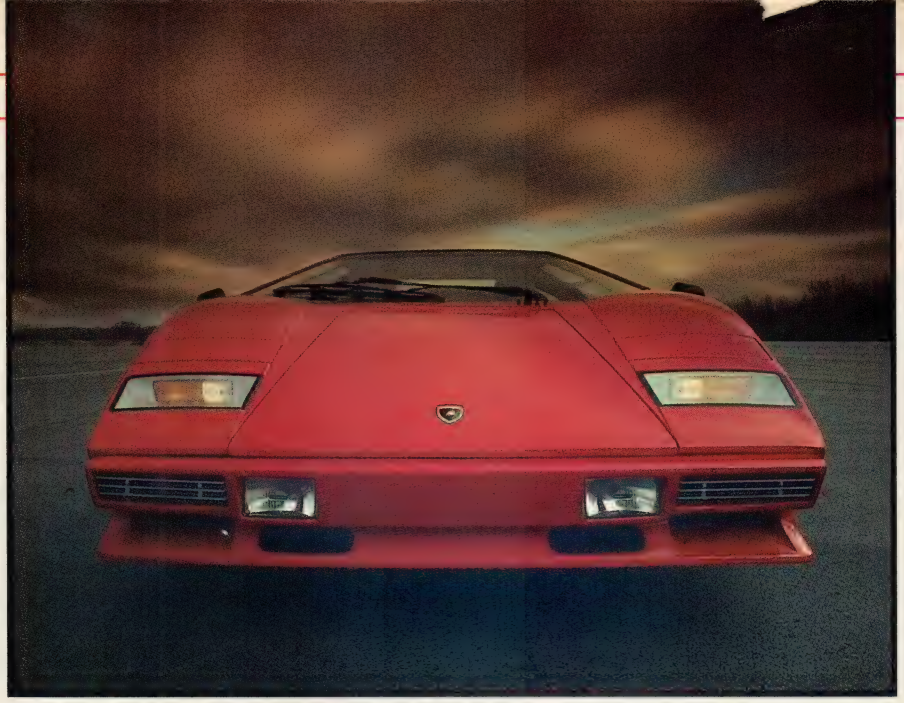
As an all-around handler, the Countach is pretty respectable as well. The huge Pirelli P7s (345/35VR-15s in the rear) stick this car down to the tune of 0.86 g—which is up there with the very best. The steering is honest, too. Still, there's nearly 3500 pounds of wide-body exotic here, so the Countach never feels truly agile. As a pure road carver, a featherweight like a Toyota MR2 is far better.

But the Countach is meant to suck the dotted lines off an autostrada, not to play boy-Fangio on a narrow back road. You want to know about speed—the dust and the glory and the banshee wail. Is the Countach the one or isn't it?

We held the pedal of the European model down until kingdom come and found our test car's limit at 7000 rpm, 500 short of the redline. The engine flattened out noticeably at high rpm, and we doubt very much that all 449 horses were present and accounted for. Our computations point to something more like 370.

Nevertheless, the speedo needle rotated all the way around to 166 mph. And this was with the optional $4000 rear wing in place. Without it, our somewhat sickly European-specification test car should have climbed easily to 175 to 180 mph. That makes the factory's claim of 173 mph for the American model (sans wing) quite believable.

As for what a perfectly tuned European Quattrovalvole would do—well, who knows? Take a good, long look at the Countach on these pages. Drink in its nastiness. Feel its aggression. Now, would you believe 215? *—Rich Ceppos*



COUNTERPOINT

• Like tasting beer for the very first time or losing one's virginity, seeing a Countach is an experience never forgotten. I've driven three in the last ten years, so this time I decided to spread the enjoyment around a little. I alerted the neighbors, scheduled a few thrill rides, and did my best to expose the innocent citizens of Belleville, Michigan, to the coming of this ground-bound Halley's comet.

Had you been there, you would have thought the circus had hit town. I could have charged admission to witness the raising of the door. Hearing and seeing the V-12 engine at its frenetic idle was a sideshow all its own. I'm sure that a few of the young and old kids who got a ride around the block would have traded their souls for the trip, had I offered such a proposition.

With audience-grabbing power like that, life with a Countach would never be blasé. You'd have to map a security plan for a trip to the convenience store. A run to the movies would have to be registered with the police, because there would surely be a crowd at every stop. So before you rush out to grab one of these beasts, remember one thing: a Countach is not a car, it's a spectacle waiting to happen.

—Don Sherman

When it comes to exotic supercars, the ancient Countach easily puts all of the newer contenders away. This car's uninhibited angular shape still has more presence and impact than anything else on the road. Sitting inside its close-coupled cockpit is also a stunning experience, for it's like being strapped inside the V of the Countach's engine. You have a limited view of the world, and you're surrounded by the intoxicating sounds of four cams, twelve hefty cylinders, 48 valves, and innumerable meshing gears. And even if the Countach is a few miles per hour slower than a Ferrari Testarossa and lacks the finely balanced handling of a Porsche 944, it still has more than enough performance and sheer thrust to support its wild image. For all its wildness, though, the Countach is pleasant to drive. Its driving position and seat are comfortable, and its controls respond smoothly and surely. The Countach definitely has my vote as the world's most entertaining supercar. Strap me in anytime. *—Csaba Csere*

Now I'm really hooked. I've been drooling over the Countach right along with you for years. After having finally driven this blood-red meteorite, all I can say is that all my expectations have been fulfilled.

Forget all the talk about how the seats are so bad, and the visibility is so bad, and the reliability is so bad. Such complaints miss the point. No one who wants or can afford this car gives a damn about any of that. The only thing that matters is that, after more than ten years on the road, the Countach is still the ultimate high-profile speed weapon on the market.

Climb in and start the car and I guarantee that you'll soon forget about the cramped seats. With its formula-car handling and howling V-12, this car has too much going for it to merit much criticism. And once you get out of the Lambo, take a look back. *That's* why people shell out the bucks for it.

So keep right on drooling. If you ever get a chance to drive this machine, you'll realize that your anticipation was well founded. *—Arthur St. Antoine*

Vehicle type: mid-engine, rear-wheel-drive, 2-passenger, 2-door coupe

Price as tested: $122,000 (American specification)

Options on test car: base Lamborghini Countach 5000 Quattrovalvole, $113,550; rear wing, $4000; gas-guzzler tax, $3850; freight, $600

Standard accessories: A/C

Sound system: Alpine 7148L AM/FM-stereo radio/cassette, 2 speakers

ENGINE

Type ..... V-12, aluminum block and heads
Bore x stroke ..... 3.37 x 2.95 in, 85.5 x 75.0mm
Displacement ..... 315 cu in, 5167cc
Compression ratio 9.5:1
Fuel system ..... Bosch K-Jetronic fuel injection
Emissions controls ..... four 3-way catalytic converters, feedback fuel-air-ratio control, auxiliary air pump
Valve gear ..... chain-driven double overhead cams, 4 valves per cylinder
Power (SAE net) ..... 420 bhp @ 7000 rpm
Torque (SAE net) ..... 340 lb-ft @ 5200 rpm
Redline ..... 7500 rpm

DRIVETRAIN

Transmission 5-speed
Final-drive ratio ..... 4.09:1, limited slip

Gear	Ratio	Mph/1000 rpm	Max. test speed
I	2.23	7.8	59 mph (7500 rpm)
II	1.63	10.7	80 mph (7500 rpm)
III	1.09	16.0	120 mph (7500 rpm)
IV	0.86	20.2	141 mph (7000 rpm)
V	0.71	24.5	166 mph (6750 rpm)

DIMENSIONS AND CAPACITIES

Wheelbase ..... 98.4 in
Track, F/R ..... 60.6/63.4 in
Length ..... 177.0 in
Width ..... 78.7 in
Height ..... 42.1 in
Ground clearance ..... 4.9 in
Curb weight ..... 3490 lb
Weight distribution, F/R 39.9/60.1%
Fuel capacity ..... 26.4 gal
Oil capacity ..... 16.2 qt
Water capacity ..... 15.9 qt

CHASSIS/BODY

Type ..... steel-tubing space frame
Body material ..... sheet steel, sheet aluminum, fiberglass-reinforced plastic

INTERIOR

SAE volume, front seat ..... 54 cu ft
trunk space ..... 8 cu ft
Front seats ..... bucket
Seat adjustments ..... fore and aft, seat angle
General comfort ..... poor fair **good** excellent
Fore-and-aft support ..... poor fair **good** excellent
Lateral support ..... poor **fair** good excellent

SUSPENSION

F: ..... ind, unequal-length control arms, coil springs, anti-roll bar
R: ..... ind; 3 lateral links, 2 trailing links, and 2 coil-shock units per side; anti-roll bar

STEERING

Type ..... rack-and-pinion
Turns lock-to-lock 3.2
Turning circle curb-to-curb ..... 42.7 ft

BRAKES

F: ..... 11.8 x 1.3-in vented disc
R: ..... 11.1 x 0.9-in vented disc
Power assist ..... vacuum

WHEELS AND TIRES

Wheel size ..... F: 8.5 x 15 in; R: 12.0 x 15 in
Wheel type ..... cast aluminum
Tires ..... Pirelli P7R, F: 225/50VR-15; R: 345/35VR-15
Test inflation pressures, F/R ..... 38/41 psi

CAR AND DRIVER TEST RESULTS

ACCELERATION Seconds

Zero to 30 mph 2.2
40 mph 3.0
50 mph 3.8
60 mph 5.1
70 mph 6.1
80 mph 7.7
90 mph 9.3
100 mph 11.0
110 mph 12.9
120 mph 16.6
Top-gear passing time, 30–50 mph 7.6
50–70 mph 7.3
Standing ¼-mile ..... 13.3 sec @ 111 mph
Top speed ..... 166 mph*

BRAKING

70–0 mph @ impending lockup ..... 183 ft
Modulation ..... poor fair good **excellent**
Fade ..... **none** moderate heavy
Front-rear balance ..... poor **fair** good

HANDLING

Roadholding, 300-ft-dia skidpad ..... 0.86 g
Understeer ..... minimal moderate **excessive**

COAST-DOWN MEASUREMENTS

Road horsepower @ 30 mph ..... 6 hp
50 mph ..... 17 hp
70 mph ..... 38 hp

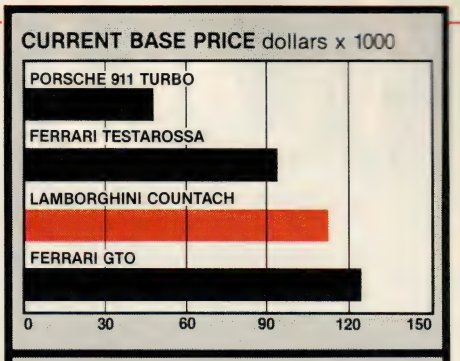
FUEL ECONOMY

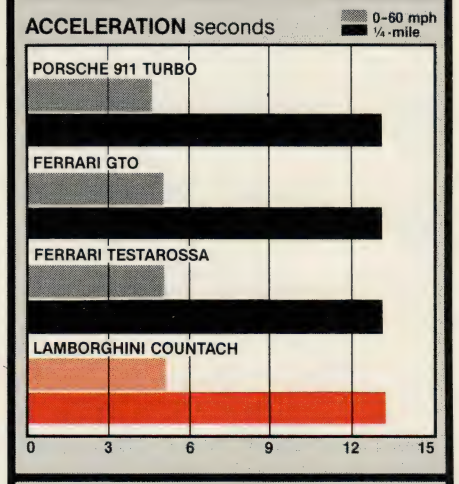
EPA city driving ..... **6 mpg**
EPA highway driving ..... 10 mpg
C/D observed fuel economy ..... **8 mpg***

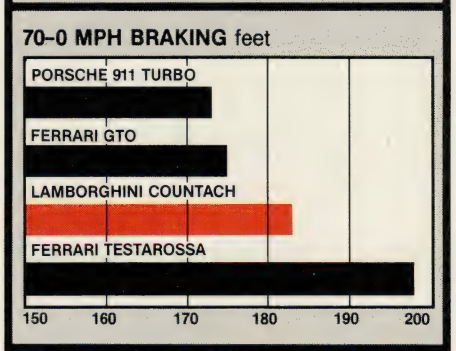
INTERIOR SOUND LEVEL

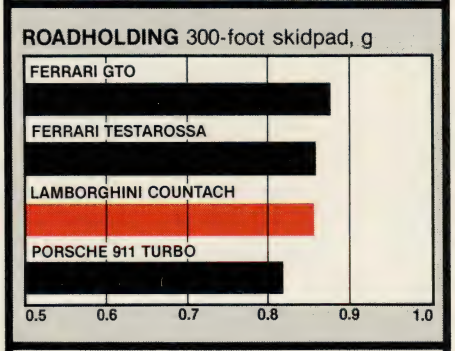
Idle ..... 63 dBA
Full-throttle acceleration ..... 95 dBA
70-mph cruising ..... 85 dBA
70-mph coasting ..... 84 dBA

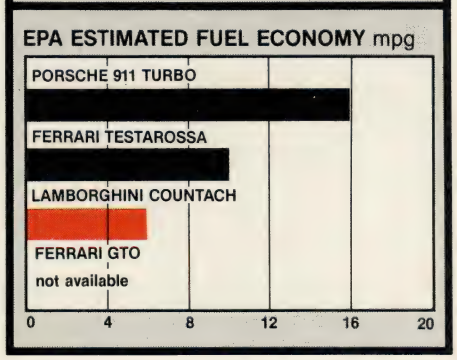
*European model





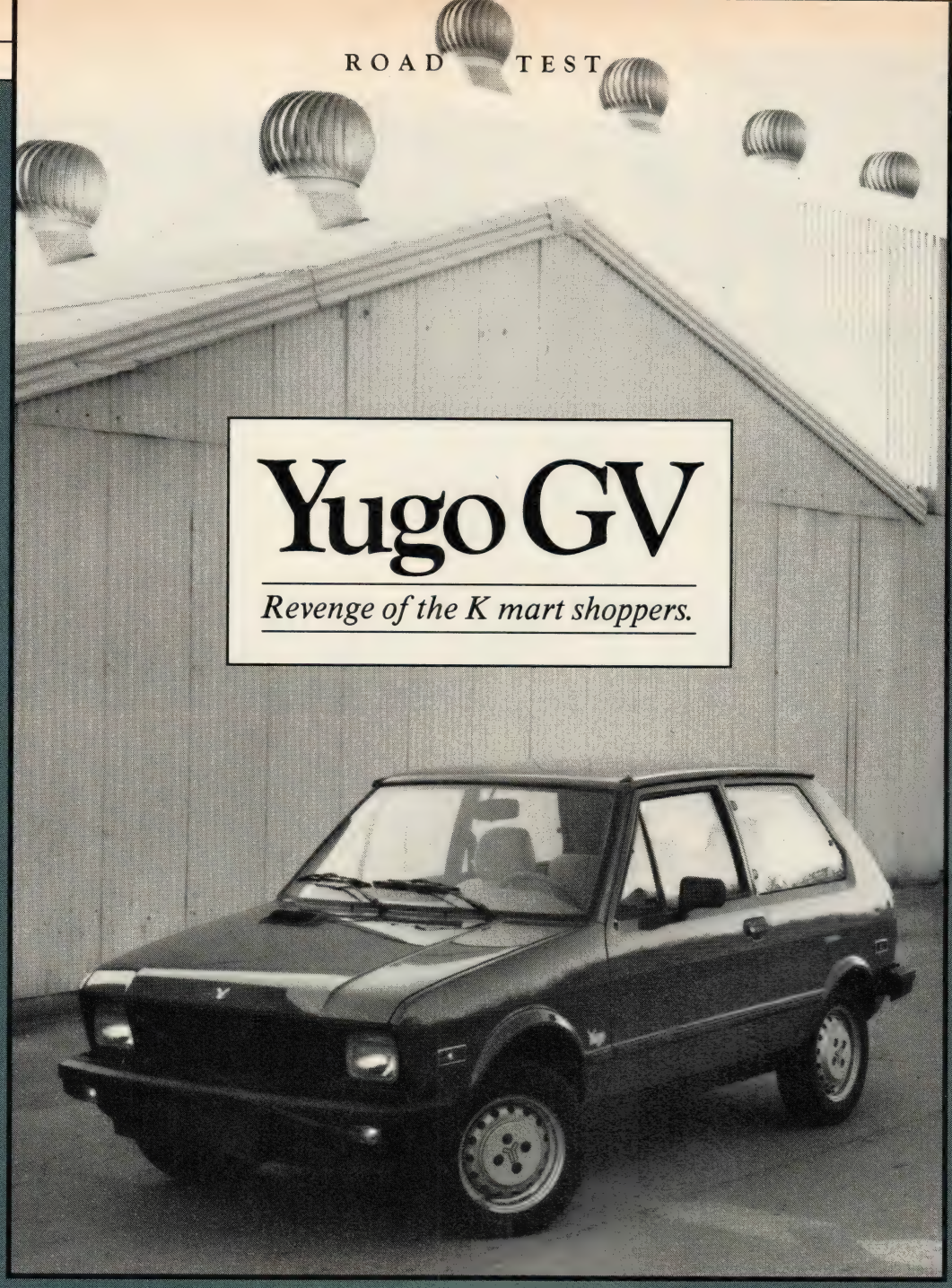






Yugo GV

Revenge of the K mart shoppers.

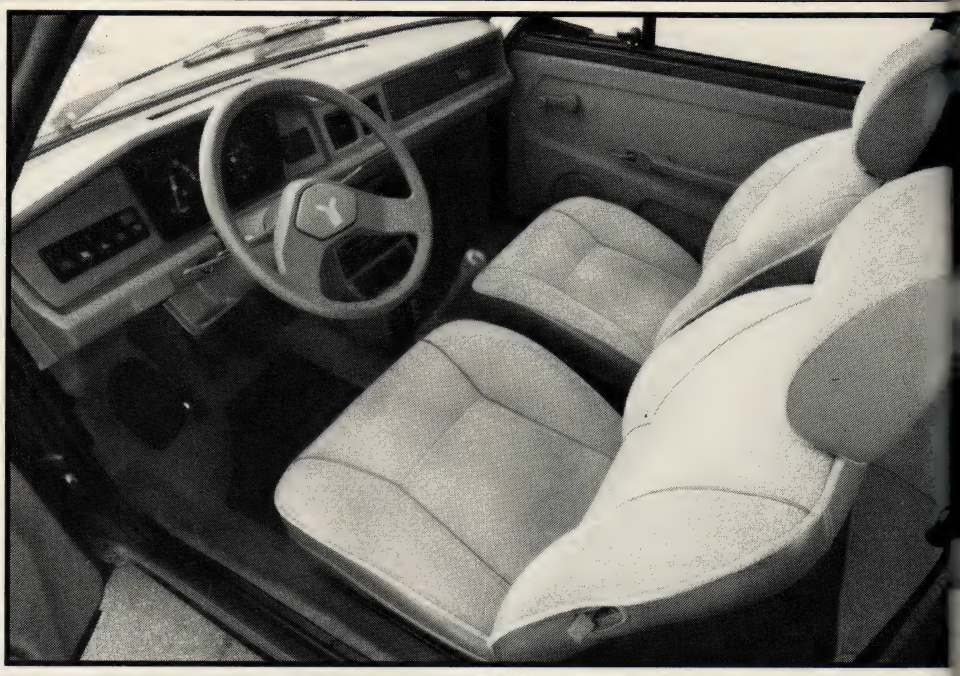


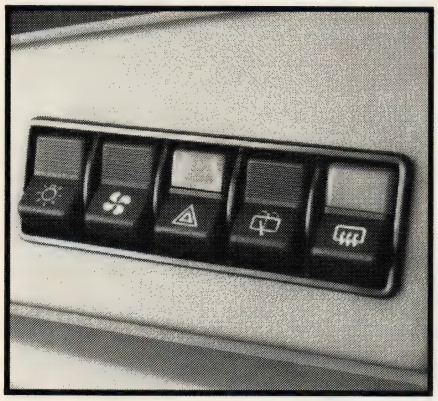
• The media hysteria that attended the introduction of the Yugo on the East Coast last year was the kind of stuff that most public-relations guys only dream about. The task of the Yugo reps wasn't so much a matter of getting the word out about their new product, but more like keeping the members of the electronic and print media from trampling one another in the stampede. From the way the press frothed at the mouth about this low-priced econocar, you might have thought that benevolent aliens had just landed and cured all the world's transportation problems.

The media's fascination with this cheap, no-frills appliance serves to remind us of an element of our society that has lately received little attention. This is, after all, the age of the yuppie. But side by side with the young upwardly mobile and their headlong rush to purchase the very finest, whether it be Cuisinarts, Giorgio Armani fashions, or BMWs, there exists another segment of the American public that has an equally compelling desire to do its shopping in flea markets and bargain basements. Thus all the interest the Yugo attracted could well be perceived as the revenge of the K mart shoppers. Their day had come at last, and they lined up in droves, cash in hand and ready to buy. They were in that emotional state that makes retailers believe that God really does exist. They were in the grip of bargain frenzy. "Damn the test drive, Martha. This sucker is *cheap!*"

We, on the other hand, were somewhat less than manic when the Yugo arrived on these shores. Knowing that it is based on an ancient Fiat design, is manufactured in Yugoslavia, and is being imported by Malcolm Bricklin, whose track record as an

PHOTOGRAPHY BY DICK KELLEY





auto mogul could be politely described as uneven, we did not expect much. Bricklin's most recent adventure in the car game—a perfunctory attempt to resuscitate the Pininfarina Spider and the Bertone X1/9—was still fresh in our minds. Nearly all of that deal wound up in the dumpster of automotive history, alongside the original Bricklin gull-wing sports car.

For the enthusiast, the Yugo issue is purely academic. This is not a car that will inflame your sporting passions. Driving the boxy little front-driver is about as much fun as driving your couch. To understand it, you've got to look at it strictly in terms of fundamental transportation.

Your first lesson in fundamentals is that the Yugo will slide, with some effort, into parking spaces previously suitable only for Chevy Sprints and motorcycles. For big-city dwellers who play the daily creative-parking game, this car is hard to beat. That's the good news. The bad news is that there isn't much room inside for either people or luggage. The two front seats provide adequate space, but passengers in the rear had better be packaged like Emmanuel Lewis if they plan on spending any time back there. And getting in and out of the back calls for the muscles and bones of a snake dancer. Consult your chiropractor before attempting this feat.

The best thing to do with the rear seat is to forget it's there and fold its seatbacks down. You will thus extend the cargo area, which is otherwise very narrow. With its high lift-over, it is also poorly designed for loading and unloading.

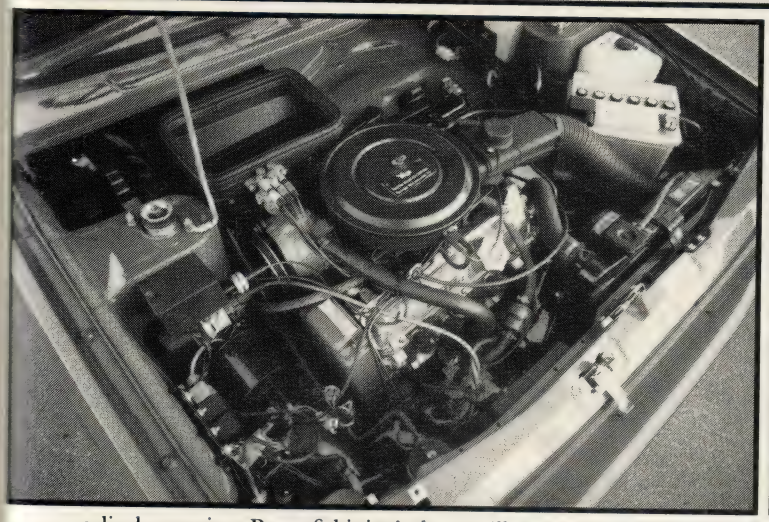
As befits a car in the minimal-transportation market, the Yugo's interior offers nothing that even remotely resembles luxury. The seats and the doors are covered in syntho-looking fabric. The plastic that covers the dash is a constant reminder that petrochemical products do indeed come from decomposed dinosaurs. There is no glove box and nary a map pocket to be found; the only storage space up front is a narrow shelf on the dash.

The instruments are limited to a speedometer, a temperature gauge, and a fuel gauge. A semicircle of idiot lights perform early-warning functions. When the fuel tank is about half empty, the fuel-gauge needle swings wildly during both acceleration and deceleration. Braking drops the level to zero, while brisk acceleration produces a full-tank reading.

The climate controls consist of three levers for mixing outside and heated air and a rocker switch that regulates the amount of air forced into the cabin. If you order air conditioning, you get an additional three-position fan switch. The hood scoop, in case you were wondering, feeds outside air to the climate-control system.

The high seats and the rake of the steering wheel encourage good typing posture. The seat cushions are rather firm and provide little side support, but they are generally pretty comfortable for short trips. Longer trips will find you regularly scrunching around for temporary relief.

The next lesson in minimalist transportation is the 1116cc, Fiat-derived four-



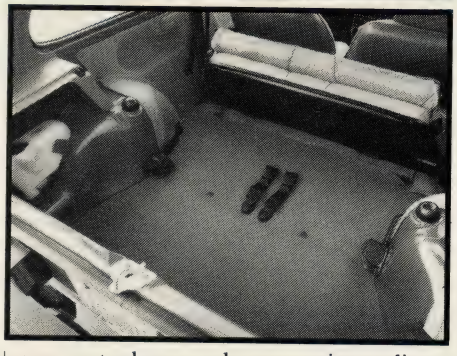
cylinder engine. Powerful it isn't, but we'll get to that in a second. A recon mission under the hood reveals the Yugo's international origins. Packard electrical connectors are in evidence. Bosch is represented by the ignition coil and the distributor. Lancia makes its contribution in the form of the oil filter. The fuel filter comes from Zapara. The cam cover goes incognito, carrying only an "1100cc" sticker. The battery is a no-brand generic unit. The name "Yugo" can be seen in only one location under the hood, on the air-cleaner snorkel.

On a chilly morning, firing the engine takes a few tries. Once it does start, an insistent foot on the throttle is needed to keep it running until it is fully warmed up. Torque is dispensed in minute amounts, so the best method for achieving a clean, lurch-free launch is to generate the revs first and then slowly engage the clutch. Without the necessary rpm on hand, the engine will buck, cough, and wheeze before it eventually meanders its way up the torque curve.

The absence of a tachometer makes it hard to know when to upshift, so Yugo has built in a Pavlovian method of acoustic negative reinforcement. Bring the engine up to somewhere near where the redline should be and it sets up a deafening, resonant drone that tells you to shift before you damage something. After only two or three assaults of this sort, you learn to stay well below valve-float territory, wherever that might be.

Do-it-yourselfers will find the engine easy to work on. The spark plugs, the oil and fuel filters, the distributor, and most major components are very accessible. The Yugo looks like an ideal training ground for shade-tree mechanics.

The shift mechanism feels as if it was designed by Cap'n Crunch. Vague and imprecise, it keeps you constantly guessing which gear you might engage on the next shift. Ordinarily, cantankerous gearboxes



are cantankerous along consistent lines; you develop a feel for their idiosyncrasies. The Yugo's four-speed gearbox, however, is intent on remaining a stranger. Reverse gear is the worst, requiring, on average, three attempts to engage.

Once under way, the Yugo feels lively enough if you don't mind the background noise of keeping the little engine on the cam. Pushing this car along freeways and busy streets does, however, require a

A sports coupe in the grand tradition, the Jaguar XJ-S provokes powerful emotions. From its smooth yet potent V-12 to its sensually luxurious interior and fluid silhouette, the S-type is a stirring example of mechanical artistry.

Equipped with overhead cam cylinder heads that produce an 11.5:1 compression ratio—far in excess of other contemporary engines—the 262 horsepower Jaguar V-12 produces abundant power at every speed, in every gear. Yet, because the firing pulses of a V-12 are more closely spaced than those of a V-8 or V-6, the engine displays a silky, turbine-like smoothness. The power lag and noisy vibration common to most high performance engines are notably absent. Silently swift, the S-type has claws.

The S-type's serenely quiet cabin is reminiscent of a fine English club. Fragrant leather covers the seats, door panels and console. Walnut burl graces the dashboard and door panel trim. Automatic climate control ensures that cabin temperature will remain at the most comfortable level. A wealth of accessories enhances vehicle operation.

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JAGUAR XJ-S

On a winding road the S-type is in its glory. With Jaguar's acclaimed four-wheel independent suspension system and power rack and pinion steering, it tracks straight and true at speed and sweeps gracefully through the most demanding curves.

Proven through years of production, the XJ-S for 1986 comes with the security of a new three year, 36,000 mile limited warranty. For complete information see our warranty at your Jaguar dealer.

Experience the manner in which a true successor to the grand touring tradition moves, and moves you. For the name of the Jaguar dealer nearest you, call this toll-free number: (800) 447-4700. Jaguar Cars Inc., Leonia, NJ 07605.

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BUCKLE UP TODAY.

JAGUAR XJ-S

recalibration of your driving style. The key is to maintain momentum at all costs, because once you start to lose speed, it takes forever to gain it back. Driving the Yugo is very much like racing one of the lower-class Showroom Stockers: you use the throttle like a light switch—the power is either all on or all off—and the loss of even one mile per hour will cost you three positions. If, for instance, you're shooting for a hole in traffic, the trick is to anticipate the hole and stand on the gas long before it actually materializes. If you calculate correctly, you should be up to entry speed by the time the hole appears. Planning ahead with the throttle doesn't do much for fuel economy, however. After hammering on this sled for weeks, we averaged only 25 miles per gallon.

The Yugo's handling is best described as theoretical. The 145/SR-13 steel-belted Tigar radials get spooked at the mere thought of an apex. In corners the steering turns heavy and sullen, like a bad Swedish movie. Under braking you get copious nose dive, and repeated applications of the save-me pedal result in a gradual loss of braking power. Though not vicious, the Yugo is generally uncooperative when the road deviates from a straight line. If you're going rat racing, leave this one at home.

It should be clear by now that the average *C/D* reader will regard the Yugo not as a real car but, at best, as a carlike curiosity. To a number of drivers, however—more drivers than we even like to think about—the Yugo is the best consumer news since the advent of the Blue Light Special. To those who believe that price and economy are everything, that getting to their destinations is all that counts, that Hamburger Helper and a side dish of instant mashed potatoes fill you up just as well as mesquite-broiled swordfish and chocolate mousse, the Yugo is about as close to automotive nirvana as they believe they're entitled to get. *—Tony Assenza*

COUNTERPOINT

• It's obvious to me that the Yugo GV is inferior to every other car sold in America. Therefore, the real question is whether its $3990 base price is low enough to offset its multitude of shortcomings. The easiest way to determine this is to compare the Yugo with a known quantity like the Chevette, which sells for about $5650.

First of all, I think a $1000 discount is appropriate because of the Yugo's unproven reliability and service network. Another $500 should be subtracted for its high noise level, and the same amount for its limited interior space. Its pronounced torque steer would produce at least $300 worth of irritation over several years of use, as would its imprecise shifting. The brake dive, the crude climate-control system, the used-towel upholstery, the feeble road-holding, and the limited mileage range each qualify for a $200 penalty. On the plus side, the Yugo deserves a $100 bonus for distinctiveness.

These calculations suggest that the right price for the Yugo is not $3990, but only about $2150. In view of that, if I had only four grand to spend on a car, I'd rather buy a two-year-old Chevette.

—Csàba Csere

There are several things that trouble me about the sudden, frenzied rush for this cheapo minibox, and they all involve money. If four grand is the most you can sink into a new car, you're not exactly loaded. You need that car to perform reliably and inexpensively—and you can't afford downtime.

It seems to me that there's a pretty big risk here. The Yugo is anything but a proven commodity. Will it run faithfully through a Minnesota winter? Will the suspension withstand the constant pounding meted out by New York City streets? Will the motor last more than 30,000 miles?

I'm not saying that the Yugo will turn itself into scrap overnight. It's just that it's got no mechanical history to allay my fears. And next to the well-developed parts-and-service networks supporting the Chevrolets and Toyotas of this world, the Yugo operation is just learning to walk.

The next couple of years will tell the tale. In the interim, if you buy a Yugo, you're a guinea pig. Be sure you can afford to be. *—Rich Ceppos*

Let's see here . . . add $599.63 for a full trunk, $348.94 for another chunk of wheelbase, $96.25 for a real back seat, $252.38 for wheels and tires from a supplier other than Revell, $210.66 for one more cylinder, $666.12 for a famous-designer restyle, $105.39 for squelching the torque steer, $185.28 for a fifth gear, $67.55 to sand down the notches between the four gears already in place, $102.83 for a roof lift to prevent spines from being shortened over sharp bumps, $54.25 for softer springs in the interest of same, $14.53 for a glove box, and, oh, another grand or two for various other civilizing influences, and you've got . . . why, it's a Honda Civic! Or a Volkswagen Jetta!

One thing about the GV: you never have to wonder how Yugo saves you money; all the missing items are right there in every other car around you. But even if you think your budget is tight, hey, it can't be that bad. Shoot, if you could just figure a way to *subtract* $3500 from the GV's price, you could sell about 300 million of the suckers in China, and be rich and famous wherever Yugo. *—Larry Griffin*

Vehicle type: front-engine, front-wheel-drive, 4-passenger, 3-door sedan

Price as tested: $5458

Options on test car: base Yugo GV, $3990; air conditioning, $680; AM/FM-stereo radio/cassette, $399; freight, $389

Standard accessories: rear defroster and wiper

Sound system: AM/FM-stereo radio/cassette, 4 speakers

ENGINE

Type	4-in-line, iron block and aluminum head
Bore x stroke	3.15 x 2.19 in, 80.0 x 55.5mm
Displacement	68 cu in, 1116cc
Compression ratio	9.2:1
Carburetion	1x2-bbl Carter-Weber 740
Emissions controls	3-way catalytic converter, EGR, auxiliary air pump
Valve gear	belt-driven single overhead cam
Power (SAE net)	55 bhp @ 6000 rpm
Torque (SAE net)	52 lb-ft @ 4600 rpm

DRIVETRAIN

Transmission	4-speed
Final-drive ratio	3.76:1

Gear	Ratio	Mph/1000 rpm	Max. test speed
I	3.58	4.8	29 mph (6000 rpm)
II	2.24	7.6	46 mph (6000 rpm)
III	1.45	11.8	71 mph (6000 rpm)
IV	1.04	16.4	86 mph (5250 rpm)

DIMENSIONS AND CAPACITIES

Wheelbase	84 in
Track, F/R	51.5/51.7 in
Length	139.0 in
Width	60.7 in
Height	54.7 in
Curb weight	1860 lb
Weight distribution, F/R	64.5/35.5%
Fuel capacity	7.9 gal

CHASSIS/BODY

Type	unit construction
Body material	welded steel stampings

INTERIOR

SAE volume, front seat	48 cu ft
rear seat	32 cu ft
trunk space	6 cu ft
Front seats	bucket
Seat adjustments	fore and aft, seatback angle
General comfort	poor fair **good** excellent
Fore-and-aft support	poor fair **good** excellent
Lateral support	poor fair **good** excellent

SUSPENSION

F:	ind, strut located by 1 lateral link and an anti-roll bar, coil springs
R:	ind, strut located by a control arm, transverse leaf spring

STEERING

Type	rack-and-pinion
Turns lock-to-lock	3.5
Turning circle curb-to-curb	31.2 ft

BRAKES

F:	9.0 x 0.4-in disc
R:	7.3 x 1.2-in cast-iron drum
Power assist	vacuum

WHEELS AND TIRES

Wheel size	4.5 x 13 in
Wheel type	stamped steel
Tires	Tigar TG 605, 145SR-13 M+S
Test inflation pressures, F/R	24/27 psi

CAR AND DRIVER TEST RESULTS

ACCELERATION

	Seconds
Zero to 30 mph	3.8
40 mph	6.2
50 mph	9.3
60 mph	14.0
70 mph	20.0
80 mph	38.6
Top-gear passing time, 30–50 mph	14.3
50–70 mph	17.7
Standing ¼-mile	19.5 sec @ 68 mph
Top speed	86 mph

HANDLING

Roadholding, 300-ft-dia skidpad	0.68 g
Understeer	minimal **moderate** excessive

BRAKING

70–0 mph @ impending lockup	202 ft
Modulation	poor **fair** good excellent
Fade	none **moderate** heavy
Front-rear balance	poor fair **good**

COAST-DOWN MEASUREMENTS

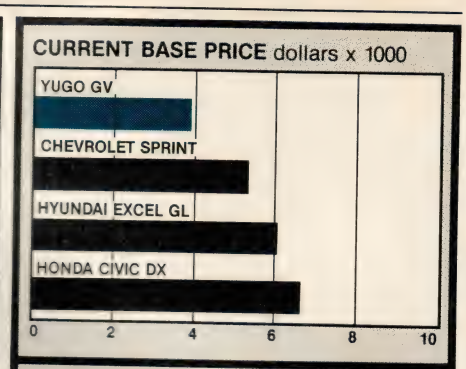
Road horsepower @ 30 mph	5 hp
50 mph	14 hp
70 mph	31 hp

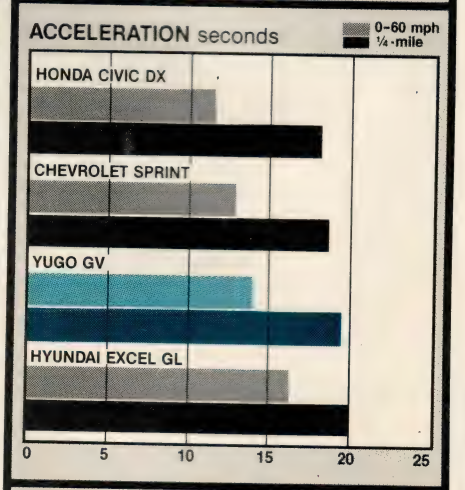
FUEL ECONOMY

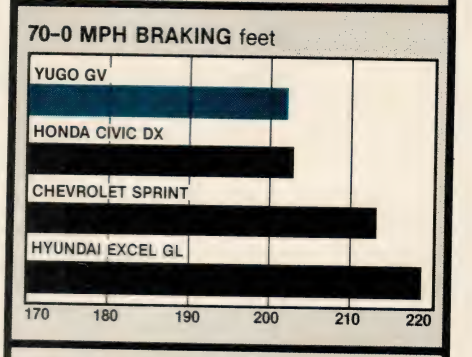
EPA city driving	**25 mpg**
EPA highway driving	31 mpg
C/D observed fuel economy	**25 mpg**

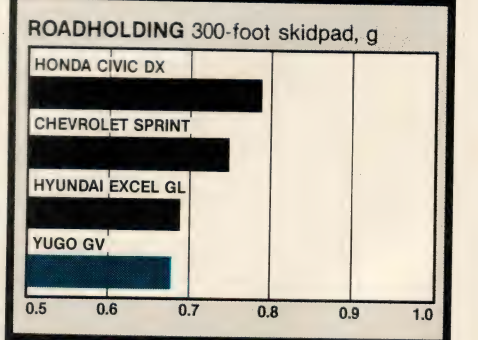
INTERIOR SOUND LEVEL

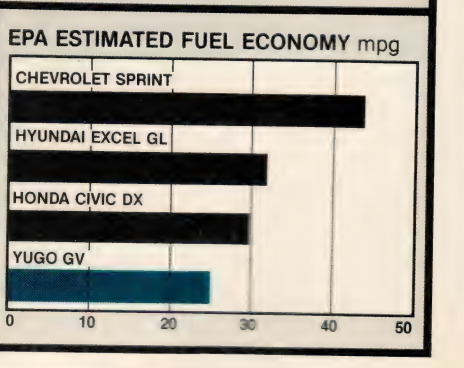
Idle	55 dBA
Full-throttle acceleration	83 dBA
70-mph cruising	81 dBA
70-mph coasting	76 dBA











Japanese Dreams

Reverie revs up and hits the road at the 26th Tokyo Motor Show.

BY DON SHERMAN

• Will Japan ever top out as an auto producer? A simple extrapolation of its acceleration curve—which has soared from zero to twenty-five percent of the world's automobile market in just 35 years—suggests that only the sky is the limit. It's true that Korea's emergence as a car-producing country, the reawakening of America's competitive spirit, and various other world economic and political factors may apply the brakes to Japan's speedy pace, but the tiny island nation across the Pacific has built up considerable momentum.

The whole world now recognizes the basic goodness of Japanese small and mid-sized cars. What used to be called the intermediate class in America has been blown apart and reassembled in a completely different fashion as seven Oriental carmakers have relentlessly clawed their way upmarket. Five minutes before it was too late, the three major American manufacturers acknowledged the Japanese threat to their existence, and now all of them have raised white flags in the form of cooperative production ventures, at the same time scurrying to get their own auto-building acts back in shape.

Japan hasn't instilled the same fear in the old-world prestige manufacturers, but give it time. Porsche has already felt the sting of competitive pressure from far below its exclusive roost, and Honda (d.b.a. Acura) is now ready to face off against Audi, BMW, Saab, and Volvo. Can a move against Jaguar and Mercedes-Benz be far in the future?

Probably not. Six months ago, we wouldn't have made such a prediction, but that was before we had witnessed two critically important events. First, last fall's Frankfurt Auto Show was, as usual, chock full of high technology, dream machines, and showgirls in short dresses; but it was also the occasion at which Japan served notice on Europe and the rest of the world by out-teching and one-upping practically everything that the Germans, the British, the French, the Swedish, and the Italians had on display. The Nissan MID4 stole the Frankfurt show, and Mazda's MX-03 foray into the exotic realm was on hand for moral support. This turn of events was not so much a sneak attack by the Japanese as it was an attempt to relieve some of the pressure that had been building in anticipation of the fall's second big event: the Tokyo

Motor Show. Another dozen or so beautiful dreamers were set to debut in Japan just a few weeks after Frankfurt, so Nissan and Mazda merely took the early-première option under the German spotlights.

When the Tokyo show did roll around, supreme confidence was the main attraction. Creative concepts were unveiled by the score. Some were small, and some, by international standards, were large. Several of the idea cars showed a more sophisticated appreciation for useful technology and pleasant styling than we would have thought possible from the Japanese just a few short months earlier.

Not surprisingly, the Occidental presence at the Tokyo proceedings was larger than ever. American and European executives, designers, and engineers flew in by the plane load to assess Japan's progress. We think it's only fair that everyone be able to see the Japanese vision of the automotive future, so we've assembled the six Tokyo stars (not counting the Nissan MID4, which we previewed last month) and half a dozen supporting players for your scrutiny. You can make your own decision whether these are mere pipe dreams or accurate peeks at the automobiles of the 1990s, but we'll vote for the latter.

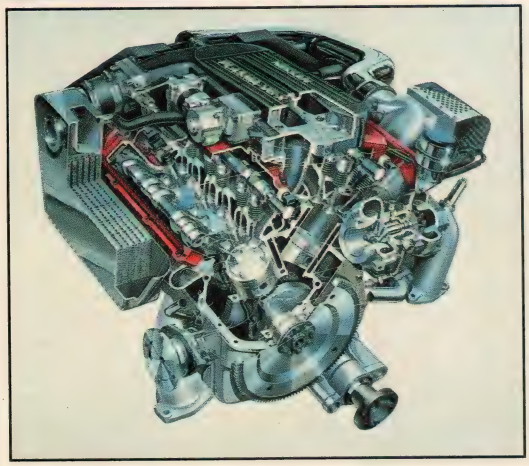
Nissan CUE-X: When Ferrari recently made it clear that it has no intentions of producing its supersedan, called the Pinin, it effectively cleared one more hurdle from the path of Japanese makers interested in entering the exotic-four-door realm. Nissan appears the most ready to make such a leap, and its CUE-X was the focal point of the Tokyo show—at least for those who had already seen or heard of the MID4.

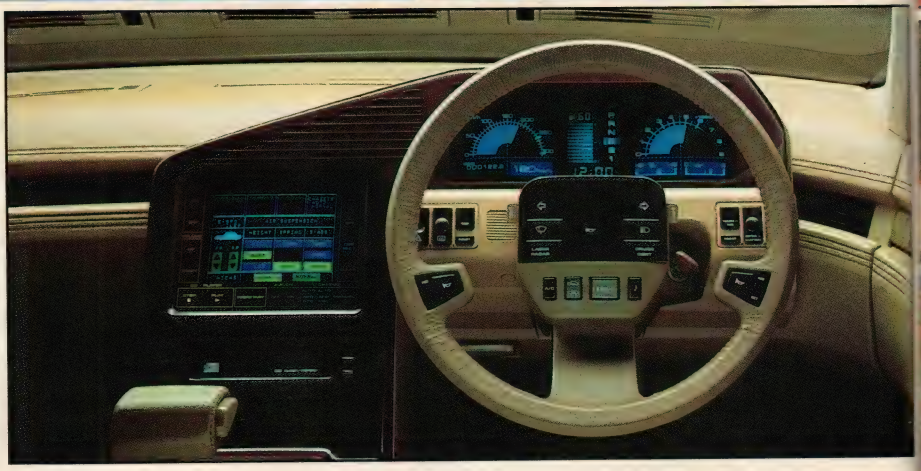
In Nissan's own words, "This is no mock-up dummy designed to tantalize. CUE-X is a working, active prototype for the reality within the next decade." Unfortunately, no test drives have yet been offered, but Csaba Csere has at least had a brief ride in a CUE-X mule.

The CUE-X's shape is a pleasant amalgam of Audi 5000, Jaguar XJ, Ford Taurus, and Pinin. Obviously, the Japanese have lost none of their willingness to borrow good ideas from elsewhere. In lieu of surface excitement, Nissan has dressed its international-looking standard-bearer with a full complement of flush details: everything from the door handles to the wheel covers is smoothly blended into the surrounding surfaces to help hold the CUE-X's drag coefficient to a clean 0.24. In addition, a computer-controlled active-aerodynamics package deploys automatically when needed: the chin-mounted air dam lowers to reduce lift at speeds above 75 mph, the rear spoiler pops up during heavy braking, and both spoilers are electrically deployed at speeds above 30 mph if a hood-mounted rain detector senses the need for additional downforce to reduce the likelihood of aquaplaning.

More remarkable than these aero tricks is the chassis that carries them. Of course, the CUE-X has four-wheel everything: drive, steering, and independent suspension. The driveline—made up of a forward-mounted V-6 engine, a central automatic transmission, and three differentials—is what Nissan calls an "intelligent" set of subsystems, each with the ability to adjust operating parameters to suit driving needs. For example, the four-cam V-8 can enhance its performance by varying its valve timing, the size of the nozzles within its twin turbochargers, the tuning of its induction tracts, and the temperature of its cooling system. The torque split to each axle is variable from 0/100 percent front/rear to 60/40 front/rear to optimize traction and handling characteristics. And the four-speed automatic transmission is


NISSAN CUE-X





electronically controlled to vary its shifting and torque-converter-lockup sequences.

The CUE-X's suspension, steering, and braking systems also have elaborate functional abilities. The four air-spring-and-strut units maintain a level ride at three electronically controlled heights. Spring and damping rates are also managed by a computer for optimal handling and braking performance. Two interacting systems steer the rear wheels, either minimally (0.5 degree or less) at high speeds or through larger angles (up to seven degrees) to improve low-speed maneuverability. The CUE-X's tires are Toyo-made 50-series designs with run-flat capability. The anti-lock disc brakes aren't particularly remarkable, except for two features: they are fully compatible with the 4wd driveline and they can be automatically applied to stop the car short of a collision whenever its laser-radar system detects an obstacle close ahead.

The CUE-X's interior is loaded with every entertainment and functional trick in Japan's fat book of future options. The transparency of the roof panels can be adjusted to allow more or less light into the passenger cell. The driver's seat has its own electronically controlled suspension system, and the front passenger gets a highly adjustable "relaxer" seat. Information systems include five different modes within the primary instrumentation display, navigational maps in communication with positioning satellites around the globe, a "secretary" program for the CRT display that can store schedule and telephone-directory information, and a telephone.

As impressive as the CUE-X appeared at Tokyo, Csaba Csere reports that the working prototypes are far from ready for production. The curb weight (at about 4000 pounds) is well over the design goal, because certain components, such as an aluminum engine block, are simply not yet ready for evaluation. Likewise, the engine isn't yet capable of delivering its advertised 300 horsepower.

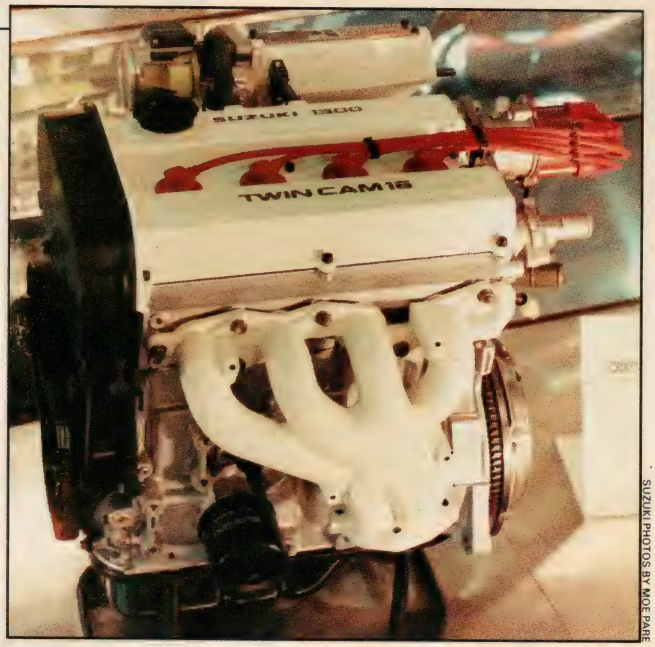
Csaba also notes that rear-seat room is noticeably lacking in the CUE-X and that the mule he rode in was rather noisy. But two things particularly impressed him during his brief exposure to the car: the electronic instrument displays and the overall design of both interior and exterior.

Like it or loathe it, the CUE-X blazes a fascinating path for any manufacturer to follow. If most of its promise does eventually come true, Nissan will in effect be building the supersedan that Ferrari has turned its back on.

Suzuki R/S1: Hearts throbbed heavily at the Tokyo show for this little seductress. It perched precariously on a steeply angled turntable and silently screamed "Ferrari" to every passer-by. Painted Testarossa red, Suzuki's bite-sized roadster looked terrific enough to be put into production tomorrow.

Suzuki's intention for the CRX-sized two-seat R/S1 is "a feeling of oneness similar to that of a motorcycle." A principal objective is a curb weight below 1600 pounds. The transverse, mid-mounted engine is a high-revving, 1298cc four-cylinder with double overhead cams and sixteen valves—but no turbocharger, supposedly to prevent any loss of throttle response. The suspension consists of strut hardware in back (presumably from the front of the Chevrolet Sprint/Suzuki Cultus) and unequal-length control arms in front. Fifty-series Bridgestone RE91 radials are fitted to fifteen-inch aluminum-alloy wheels. The five-speed transaxle (presumably also from the Sprint/Cultus) drives the rear wheels, and disc brakes are in place at all four corners.

The interior has only a couple of gim-



SUZUKI PHOTOS BY MOE PARE

micky features to detract from the no-frills, go-fast practicality of this slick little skateboard. The bucket seats are fitted with special ducting that pipes ventilating airflow to the bottom and backrest cushions. The steering wheel and the center console are a bit showy. And Suzuki has incorporated an electronic instrumentation display to catch the eye of the ooh-and-aah crowd, in spite of the fact that the hard-core sports-car buyer would probably prefer a nice set of needles and dials.

The lack of both a top and any protective moldings for the front and rear glass panels would have to be rectified, of course, in a production version of the R/S1. It's a pity, though, that the engine-under-glass midsection would probably give way to conventional cover panels, because the all-alloy four-banger is a jewel to behold. In other respects, the R/S1 looks fairly practical and producible, and nothing would make us happier than seeing nearly everything between its squinty-eyed nose and its nicely rounded rump preserved for production.

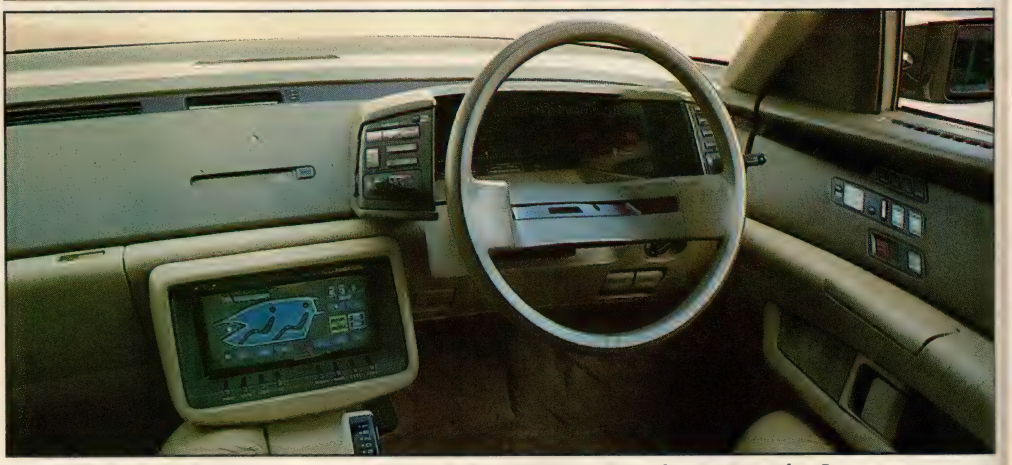
According to the scuttlebutt, Chevrolet's plans aren't far from our interests. *C/D* moles say the R/S1 should hit the showrooms by 1990, sporting metal body panels (the show car's are fiberglass), 110 horsepower, a Chevrolet nameplate, and a price tag that will undercut the Fiero's. The line forms here.

Toyota FXV: It's interesting that Japan's two heavy hitters—Nissan and Toyota—have both taken aim at the high-performance-luxury-sedan target for their concept-car experiments. The two examples shown at Tokyo were similar in size (the CUE-X is slightly larger) and in many other ways, but the Toyota FXV is in several respects the more radical solution.

Like its cross-court competitor, the FXV ("future experimental vehicle") has four-wheel drive, four-wheel steering, an electronically controlled hydropneumatic suspension, anti-lock braking, and, in the cockpit, a heavy load of display and communication electronics. But the Toyota chassis has a more exotic mid-engine layout, with a four-cylinder prime mover powering the car through a five-speed automatic transmission. The FXV is also more radical in its coachwork. The end product is an 0.24 drag coefficient (identical to the CUE-X's), but it's achieved with sleeker windshield and backlight angles. And although the FXV's large rear doors are fairly conventional, its front portals are truly unusual: at the touch of an exterior switch on either side, a microprocessor energizes a special "easy access" system that swings up the appropriate roof panel and opens the door to the halfway position. Then it's up to the human to supply the effort needed to push the door fully open. The driver's-side switch also pivots the steering wheel up and makes the seat glide back and down.

The energetic four-cylinder engine in the back of the FXV produces 230 horsepower from a mere 1998cc of piston displacement. Boost is provided by both a Roots-type supercharger and a ceramic-turbine turbocharger, which respectively fatten the low and the high half of the torque curve. In addition to conventional intercooling and a *de rigueur* four-valve cylinder head, Toyota's advanced engine makes use of ceramic-fiber-reinforced magnesium-alloy pistons, plastic intake manifolding, variable intake porting, ceramic-insulated exhaust passages, a distributorless ignition, and an electronically controlled throttle.

Inside the cockpit, the driver is confronted by a CRT screen similar to one Toyota already has on the market in Japan, though the FXV's is larger and greatly expanded in function. The entertainment options include television, 8mm videotape, a synthetic warning voice, and a heads-up windshield projection of car speed and various warnings. The rear-



view mirror is a liquid-crystal device that automatically reflects the proper light level, eliminating glare. Two telephones are on board—one built into the steering wheel for the driver and a more conventional handset for passenger use. Instead of dialing to place a call, one simply presses the appropriate spots on the touch-sensitive video screen.

The Nissan CUE-X is a more practical design and may well be on its way to production. The FXV, in contrast, is a conglomeration of all the advanced thinking within Toyota that could be built into an automobile. Some of its features will doubtless reappear in the Toyotas of tomorrow, while others will fall into the deep ditches of good intentions that line the path to the future.

Toyota AXV: Toyota's second show star, the AXV ("advanced experimental vehicle"), weighs a mere 1430 pounds and is only 3.6 inches longer than a Honda CRX, but it easily seats four in comfort. While its big brother, the FXV, is aimed at the high-performance end of the spectrum, the AXV is an efficiency special.

The AXV's body is a low-drag (0.26 Cd), high-roofed design with an unusual array of four doors: two on the left (curb side in Japan), one longer portal on the right, and a conventional hatch in the rear. To minimize airflow disturbances, the window glass, the low-profile headlamps, and the perforated wheel covers have been made as flush as possible. The exterior mirrors are slotted to allow the slipstream to pass through them, and engine-cooling air that enters the forward compartment is exhausted through the top of the hood.

A tiny and efficient three-cylinder diesel powers the AXV, driving the front wheels through a continuously variable transmission. The little thumper displaces only 1.1 liters but produces an impressive 55 horsepower, thanks to turbocharging and direct fuel injection.

To minimize curb weight, the AXV makes extensive use of structural plastics and other exotic materials. The hood, the steering wheel, the road wheels, and the one-piece rear suspension are molded in fiberglass. All the windows are made of polycarbonate plastic and coated with a glazing that reflects sunlight.

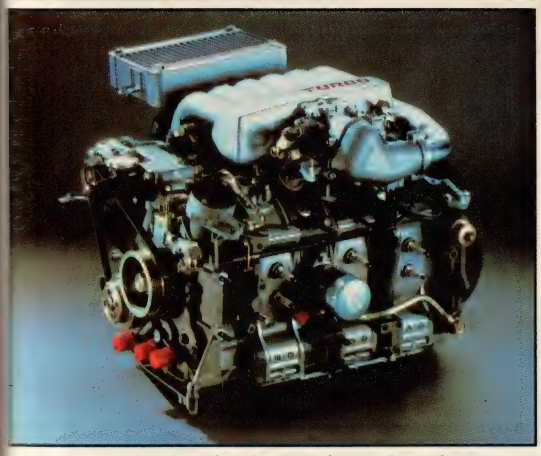
The interior contains no particularly remarkable gadgets or frills. Instead, the packaging of the seats and controls has been aimed at maximizing the room available for a driver and three passengers.

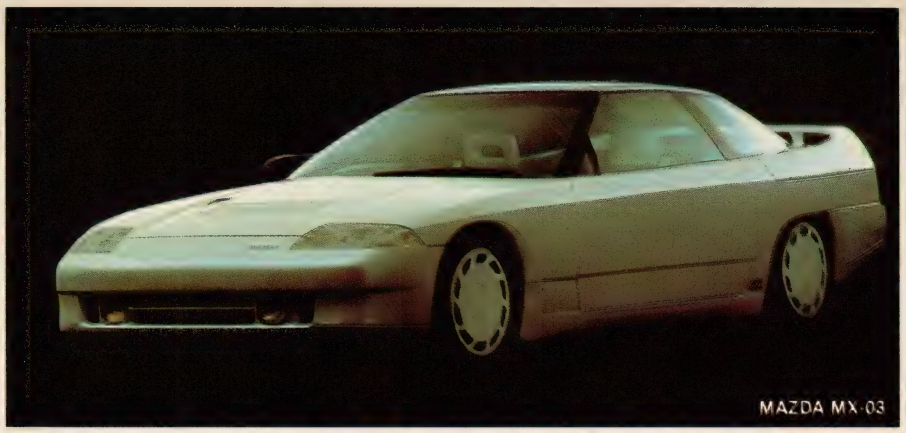
The AXV's bottom line is fuel efficiency. At a steady 37 mph, this family hauler sips diesel oil at the rate of 127 mpg, according to Toyota. In the ten-mode Japanese urban-driving cycle, it delivers 80 mpg. If OPEC ever rears its ugly head again, Toyota is prepared to deal with the situation.

Mazda MX-03: Mazda started the four-wheel-steering craze at the Tokyo show two years ago with a family sedan of the future called the MX-02. The basic concept has been transferred to a high-performance sports coupe called the MX-03, making it crystal clear that all-wheel steering is anything but a technological flash in the pan.

In a way, it's unfortunate that the MX-03 has been saddled with the responsibility of accommodating two passengers in back, because it is otherwise Japan's version of the exotic Porsche 959. Like the German star of the 1983 and 1985 Frankfurt shows, the MX-03 has electronically controlled four-wheel drive at the heart of its performance capability.

The MX-03 on the stand at Tokyo was the perfect showcase for Mazda's latest rotary-engine advancements. Now that a turbocharged and intercooled rotary is in




MAZDA MX-03

production in the RX-7 Turbo, the next logical step up the performance ladder is a larger engine displacement and more horsepower. Mazda has made the climb by investigating a three-rotor design that has 50 percent more swept volume than the current RX-7 motor and produces an admirable 320 horsepower. Other refinements include the use of aluminum rotors to save rotating and reciprocating weight, a dry-sump oiling system to minimize engine height, and a ceramic turbine wheel in the turbocharger.

The potent three-rotor engine is located ahead of the MX-03's passenger cell but well back in the chassis in order to produce a respectable weight distribution and to leave enough room for the front driving axle. A fairly conventional four-speed automatic transmission in the middle of the car is in unit with a special torque-splitting mechanism; instead of a central differential, Mazda uses two oil-filled, multi-plate clutches to divide the engine's output between the front and rear axles. The driver controls the split from the cockpit, his orders being executed by means of an engine-torque sensor, a control unit, and various actuators.

The second generation of Mazda's four-wheel-steering concept functions very much like the original, with counter-steering at low speeds and in-phase steering to improve high-speed handling. One new twist has been added, however: a complex mechanism just beneath the airplane-type steering yoke varies the steering-gear ratio over a wide range. A very fast ratio is used at parking speeds, and a very slow one enhances directional stability at high speeds. As a result, the yoke moves only 120 degrees, lock to lock.

The MX-03's interior is conventional in design but for three features: the steering yoke, a heads-up display of car speed and a few other items of information, and a two-mode electronic instrument panel, which offers the driver a choice of either a huge tachometer or a full complement of normal readouts.

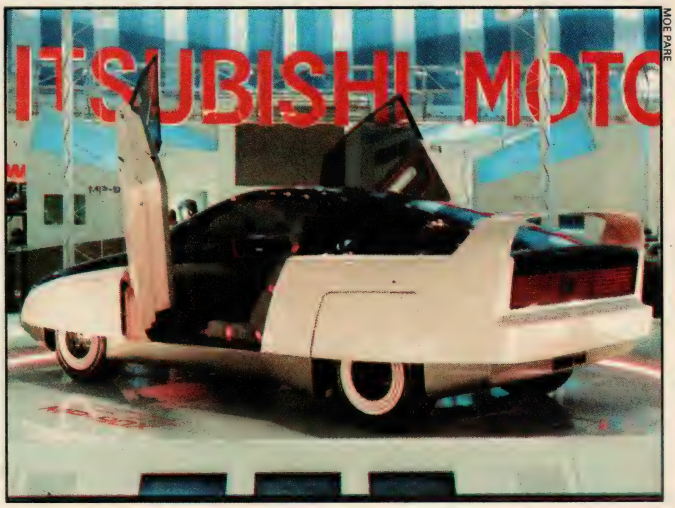
Although the mightiest Mazda ever built is wrapped in a rather unbecoming package, the MX-03's bodywork is extremely functional. It yields a drag coefficient of only 0.25, and the combination of a wing and ground-effects bodywork at the rear is said to produce significant downforce.

Mazda's performance claims for the MX-03—a top speed of over 180 mph and a zero-to-sixty time of less than five seconds—are certainly nothing to sneeze at. Still, we can't help wondering why Mazda has not yet unveiled the inevitable superdeterrent: one more rotor, a mid-engine layout, and two-seat coachwork to go.

Mitsubishi MP-90X: The showpiece on the Mitsubishi stand at Tokyo was not so much a car as it was a mobile, two-way communicator with the rest of the universe. The MP-90X will be in touch with NAVSTAR satellites (scheduled for operation next year) that can sense its precise location on earth. It's also capable of communicating with the outside world by three other channels: Japan's telephone network, conventional television reception, and electronic mail. The driver determines his position and reads his mail by using either a CRT display screen or an on-board printer.

Although the MP-90X is essentially the phone booth and mailbox of the future, it looks nothing at all like either. On the contrary, its dolphin-shaped body is one of Japan's most ambitious attempts to minimize aerodynamic drag. Mitsubishi achieved a Cd of 0.22 for the MP-90X by smoothing all of its external surfaces, controlling its cooling and ventilating airflow, and eliminating such protuberances as rear-view mirrors and door handles. A fiber-optics system displays the rear view

MITSUBISHI MP-90X



on the CRT screen. The doors pivot upward for entry, and elbow-high slots (with variable transparency) are provided in lieu of roll-down windows.

The MP-90X's chassis is not its claim to fame, and Mitsubishi makes little mention of the car's engine, except to note that various underhood systems are actively controlled. Computers also manage its hydropneumatic suspension and variable-ratio four-wheel-steering system, which is uncannily similar to the MX-03's design.

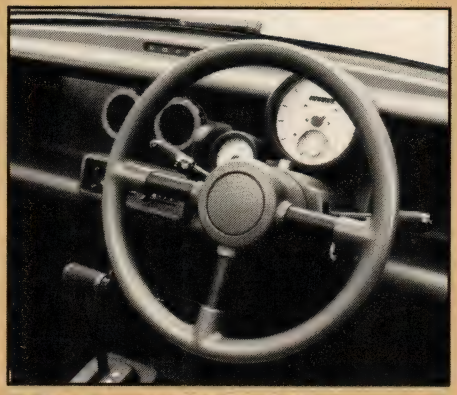
Mitsubishi is not likely to build anything like the MP-90X in the foreseeable future. The radical concepts it embodies, however, should encourage more advanced thinking, both inside and outside the sponsoring organization.

If the dream machines on display at Tokyo haven't already sent those who intend to compete with Japan back to their drawing boards, we're not sure what will. The heavy turnout of creative concepts makes it safe to assume the following:

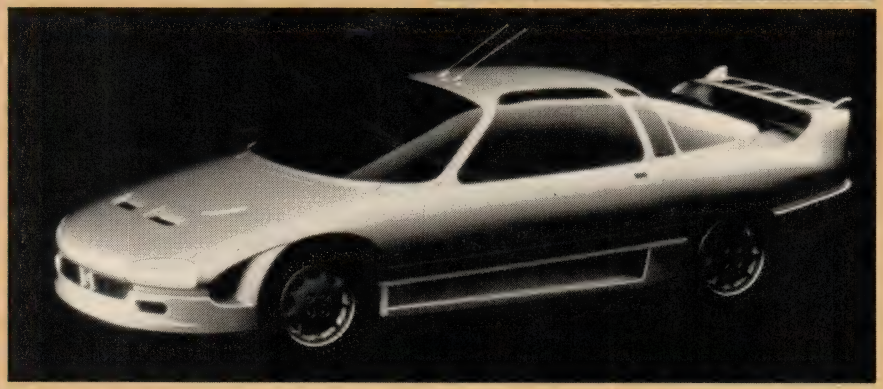
- Japan will eventually build expensive sedans and sports cars to compete with the long-established brands.
- The performance era is alive, well, and prospering nicely indeed, with both less weight and more power heading our way.
- The ultimate aerodynamic shape will probably settle out at a drag coefficient in the 0.25 range. Downforce is the new frontier; more interesting shapes and active aerodynamic-control surfaces will follow.
- Four-wheel steering (with relatively large rear-steer angles) will see production during the 1990s.
- The best may be yet to come. One of Japan's leading innovators, Honda, has a longstanding corporate policy of *not* revealing its advanced concepts. At the Tokyo show, the Honda display consisted solely of production models. ●

Six in Support

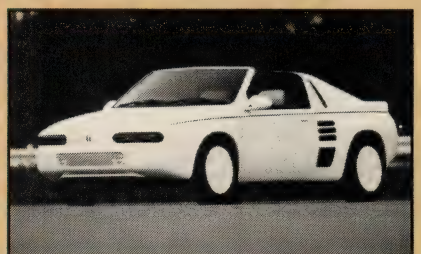
Consider them creative catnaps.



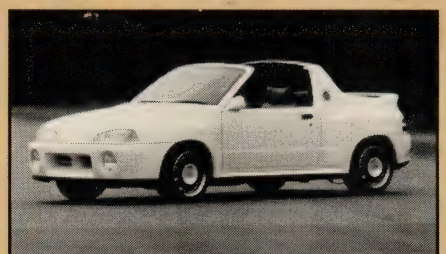
Nissan's Be-1 design study is a high-style, tailor-made minicar meant to be "put on and worn." Since its floorpan and drivetrain are from the Nissan March, this is one prototype that could easily go into production.



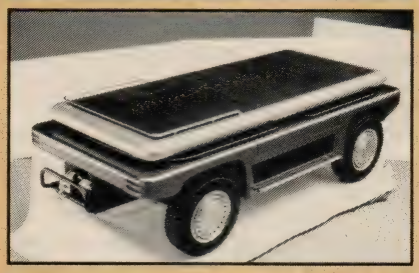
Weirdness was alive and well where you'd expect to find it: on the Subaru stand. The F-9X, supposedly designed with competition in mind, is a four-wheel-drive chassis dressed in Buck Rogers coachwork. Its supercharged and turbocharged flat four-cylinder produces 360 hp.

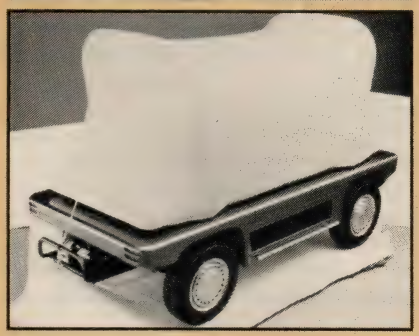


Isuzu's entry in the four-wheel-drive sweepstakes is a targa-topped two-seater called the COA-2. Power is provided by a midships-mounted four-cylinder (with a longitudinal orientation) that has twin cams, sixteen valves, turbocharging, and intercooling.



Suzuki's R/P2 two-place open sportster is a nifty remake of the Sprint/Cultus, featuring what its maker calls "dynamic and ingratiating styling." A turbocharged and intercooled, 800cc, twin-cam three-cylinder engine powers the part-time-four-wheel-drive chassis.





The Daihatsu Trek is a wilderness machine for those who prefer four-wheel drive to walking. A true convertible, this single-seater becomes a comfy canopy bed at night. In the event the wilderness gets too wild, the Trek is equipped with TV and a telephone.

Appropriately enough, this car started life as a Charade. Taking that thought to the extreme, Daihatsu and De Tomaso have teamed up to replicate Renault's 5 Turbo, labeling the effort the De Tomaso 926R. A turbocharged three-cylinder in the middle produces 120 hp.

Rollin' Rollin' Rollin'

The army reinvents the wheel, and ya know what? It works.

BY PATRICK BEDARD

• Rumors are floating through the halls again. Tanks ride well; that's one. Okay, not exactly Coupe de Ville cushy, but better than a rock slide. This is hard to believe, but Don Sherman himself is the source of this one.

Another is that the U.S. Army is planning to ride into the next war on dune buggies. No horseradish. Usually reliable sources report seeing a fleet of things that look like camo-painted Paul Bunyan lawn chairs with VW engines in back and knobby Goodyear Wrangler R/T tires on the corners. Machines like that have to be dune buggies, right? Or else Uncle Sam is playing with GoBots.

Dune buggies? Get serious! The army is supposed to be boots and blisters, clanky tanks and cranky DIs. No way is it supposed to be fun. Dune buggies? Next we'll be hearing about ground-effects armored personnel carriers with turbo Cosworths.

Well, we know you don't read this magazine for rumors. The supposed sightings were just south of Tacoma, Washington, at a place called Fort Lewis. Somebody had to go investigate.

Before you read further, a bit of advice. If you think of the U.S. Army as a bunch of trained killers holed up in bunkers waiting for the big one, it's time to update your slide show. We're talking the modern, all-volunteer army here. This is a crew of regular folks.

Certainly they're not paranoids; the security is tighter at General Motors. On the Interstate south of Tacoma there is a "Ft. Lewis" sign with an arrow that points the way through the fir trees. It points for commuters and Commie conspirators alike. And the MP at the front gate is an equal-opportunity waver. Your investigator could be a havoc-wreaking Iraqi with his Jockeys stuffed full of TNT. The white glove just keeps waving.

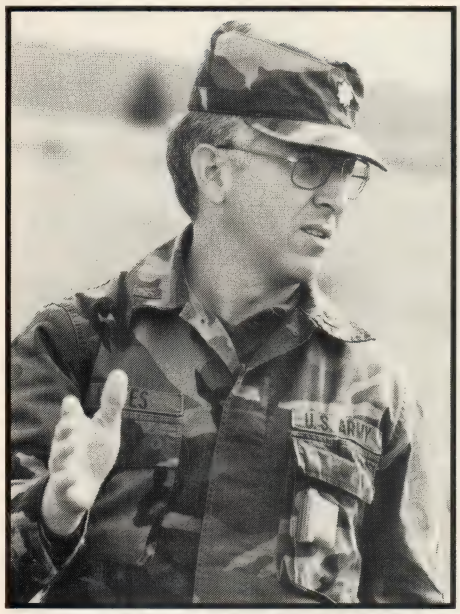
Inside, the place looks like an Ivy League campus, all spreading trees and red-brick buildings. Except the students are wearing camo suits and shiny boots. And they're seriously into unisex. You can tell the women from the men, but it's hard. Whites-of-the-eyeball range isn't nearly close enough.

Fort Lewis is a big operation: 30,000 military and civilian personnel work on post. Defense may be the end product here, but it's way down the line, like the cars at GM. You don't find many employees packing wrenches in the halls of the Tech Center, and you don't see many soldiers packing rifles at Fort Lewis. Their everyday jobs appear to have little to do with protecting the nation.

As a matter of fact, we're looking for the PR department. All the red-brick buildings look alike. Signs that say "3/5th Cav" and "9th AFSC" and "2/1st Inf" seem hopelessly cryptic, even to a trained *C/D* investigator. We're looking for the Ninth Infantry Division (Motorized), which is supposed to be the dune-buggy outfit. Finally we find the sign for it. "Old Reliables," it says.

Just like any campus building, this one

PHOTOGRAPHY BY DAVID DEWHURST



In today's army, no matter if you're the PAO officer (Major Bates, left), or the ceremonial gunners (above), or a member of the marching band, you get your business suits from the same tailor. He stocks any color and pattern you could ask for, so long as you ask for camo.

has a roster of its offices inside the door. More cryptic abbreviations, but nothing for PR. "You want the Public Affairs Office," we're told. So that's what it's called in the army. We find "PAO" on the board.

Walking down the corridor, still yards from the PAO, we're encountering some heavy voice energy: male, assertive, accent geographically centered somewhere between good ol' boy and alligator wrestler. No question who it is; if the phone calls count, we've already met. Just inside the door, clad in boots and camo, is Maj. Kenneth Bates, Public Affairs Officer, Ninth Inf Div (MTZ), finishing a stand-up meeting with some guy who gets his business suits from the same shop.

Bates is stocky, getting on toward his late thirties, with gray working its way up from his temples. "Calvin, Louisiana," he responds to the question about his accent. "Farm boy."

Somebody, maybe his secretary—you can't tell when they're all wearing boots and camo—unloads on his desks a big Styrofoam cup of coffee, along with a foil packet of whitener and about nine pink envelopes of chemical sweetness. His country-boy face tightens. "I don't know why they bring that shit," he says, shoving the pink out of the way with the back of his hand. Out of his bottom drawer he pulls a box of real sugar.

He has a schedule already planned. At 1000 hours will be the official logbook turnover of the High-Mobility Multi-Purpose Wheeled Vehicle (HMMWV). "HummVee," he says. "Don't call it 'Hummer.'" This ceremony has been planned for months. The Ninth Infantry Division is to be the first army outfit to field this replacement for the Jeep. There will be a big to-do on the parade ground. The TV crews are already starting to arrive. We'll have to get over there pretty quick.

Then at 1100 there will be HMMWV field maneuvers for the media to watch and photograph. At 1400 ("I don't know how much you know about the military; that's two this afternoon," Bates says) the Fast Attack Vehicle will be available. Then at 1600 we'll be taken to the Skunk Works. And if we're still around, we'll see a demo of the Vulcan Wheel Carrier at 0900 tomorrow.

On the way to the parade ground, Bates explains what "(Motorized)" means. Traditionally, there have been two kinds of infantry: heavy and light. Heavy has armor: tanks, APCs, artillery, that sort of noisy stuff. Heavy divisions pack a hell of a wallop, but they don't exactly fit in a suitcase. For that reason, the army tries to plant its heavy divisions where trouble *might* start in the future; Europe, for example, facing the Warsaw Pact forces.

Light infantry consists of foot soldiers with mostly hand-carried arms—the ground pounders. Light divisions are quickly deployed, but they have to walk after they're dropped off and they don't have much combat punch.

The idea of another sort of infantry division has been evolving over the last five years—a force that could pack up and fly away in relatively few plane loads, that would derive its strength from the brains of high technology rather than the brawn of sweat and steel. A number of concepts were tried, and in December of 1984 the army chief of staff settled upon motorization, which means, in essence, wheeled vehicles only. Light and quick. No more tanks slugging it out toe-to-toe. Outsmart the enemy instead. Watch him with electronics. Sneak up on his blind side. "Shoot and scoot," Bates says.

The Ninth Infantry Division (Motorized) is the prototype. It will test the concept: What kinds of machines? What kinds of strategies? What kinds of tactics? It's all being worked out now, cut-and-try style. By the end of the year, the Ninth will be transformed—1360 C-141 loads of slam-dunk seriousness from Uncle Sam—but the division still won't be in its final form by any means.

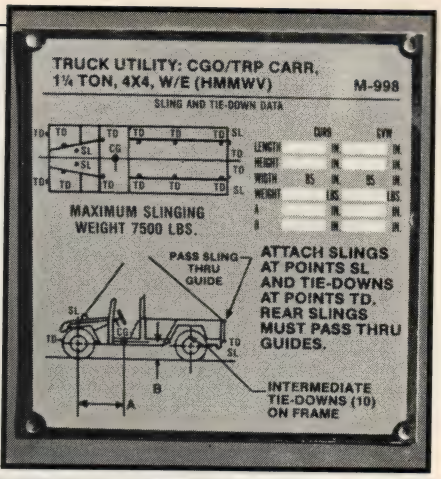
Right now, no one can see the end of the cut and try. The Army is searching for a better way, and that will be whatever works in the tests. The only certainty is that, if the technologists keep imagining and the Congress keeps approving, the Ninth Infantry Division (Motorized) will change the way people think of the army. In the meantime, guys who like wheels and measure performance in zero-to-knockout-punch times want to be in the Ninth. It's where the action is.

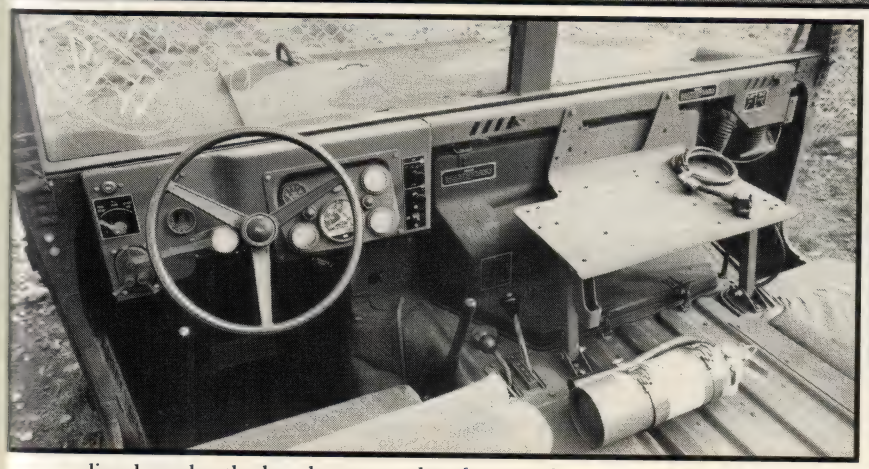
An army band is already formed up on the parade ground, along with a color guard and a row of 105mm howitzers. And there is the HMMWV, the special presentation version, all shined up and with Armor All on its tires. Nothing can be done about the standard-equipment camo paint, which has been specially concocted in some antitoxin lab to shed yellow rain of every conceivable hue.

Apparently it sheds Simoniz with equal conviction, because the bodywork has all the luster of boiled Brussels sprouts from the mess hall.

"The contract is for 55,000 of these bad boys," Bates says. "We'll get about 2500." For the time being at least, the HMMWV will be the Ninth's primary vehicle. Five of them will fit in a C-141. In the field, they'll haul troops and supplies, and mounts have already been worked out for various machine guns, cannons, and missile launchers.

The band has started to play—could it be?—"The Yellow Rose of Texas." They're marching around the field as if it were half time. Now the howitzers take over. Bates promised us a thirteen-gun salute, and they don't stop till the gunsmoke shrouds the firs that crowd the far end of the field. Take that, you doubters of volunteer might! The presentation HMMWV drives to the 50-yard line trailing a wisp of





After years of using the jeep for everything but a toothpick, the army has rethought the job of its light-utility vehicle. The basic HMMWV (above) is the new solution.

diesel smoke, the band stops, and we have speeches.

Later, with TV microphones poking at his face, Maj. Gen. Donald S. Pihl, commander of the Ninth, says he's "really excited" about this new piece of equipment.

The investigator's ears don't believe what they've heard. The Ninth is so state-of-the-art, it even uses the latest civilian clichés.

After lunch we head back to Bates's office to be briefed on the Fast Attack Vehicle—"FAV" in army parlance. Even before seeing his phone messages, Bates's eyes zero on the pile of pink packets left over from morning coffee, and with one sweep of his arm they cascade off his desk and into the wastebasket. "So much for that shit," says the PAO man from Louisiana.

The FAV, in fact, *is* a dune buggy, your basic Chenowth off-road racer made into a tank fighter by modifications cooked up over at the Skunk Works. Bates has photos of camo-painted open-wheelers with various instruments of destruction bolted atop their roll cages, one per buggy: a tube-launched, optically sighted, wire-guided (TOW) missile launcher, or a Squad Automatic Weapon (SAW), or the Mk 19 40mm automatic grenade launcher, or a .50-caliber machine gun. Your investigator thinks they look, uh, dangerous—and not just to the enemy. All that weight parked on top has to screw up the dune-dancing something awful.

If we're looking for a machine that represents the spirit of the Ninth, Bates says, the FAV is it. They've got 116 in inventory now, each with a 1600cc, dual-port VeeDub in back, a basic off-road-racer engine making 90 hp from a single two-barrel Weber. Flat out is 75, maybe 80 mph.

Last year, in war games down at Fort Bliss, Texas, the FAVs showed their stuff. For three days and nights, about half a gross of them went up against a tank force augmented by paratroopers. With no armor for protection—hell, even their plexiglass windshields quit at collarbone level—the buggies had to hide out in the daytime. But at night they linked up with their command post by computer, allowing an off-field quarterback to watch the big picture and call in the plays. Then, with special night-vision equipment, they snuck around in the dark and wasted the tanks. "We think we're pretty hot," Bates says without braggadocio, just stating a fact.

Your investigator is hoping the demo FAV will have some sort of blaster on top, just to present the idea of a killer dune buggy in full regalia.

No luck. The FAV waiting for us out on the maneuver field is unarmed. So is Staff Sgt. Calvin Arland, of Kalispell, Montana, who is sitting on a tire as we approach. Arland is still in his wispy-mustache years. After a few yessirs and nosirs to Bates, he begins pointing out details of the machine: the lever by the shifter is the cutting brake, which can lock either rear brake for cutting sharper turns; the FAV can run with only one front tire, so, in case of a flat rear, a front can be moved to the back. His thick glasses reinforce the image of a technician; but his eyes say something else, something not so easily pigeonholed, the investigator thinks. But it's a familiar look.

The FAV looks familiar, too, but only vaguely. When was the last time you saw an off-road racer with no decals, no fresh-from-the-fab-shop shiny metal pieces? The dune-buggy lineage is inescapable—there are three shock absorbers neatly angled forward from each rear suspension—but the emphasis seems more truck than speed. There's a huge cargo box made of expanded metal behind the seats, and another on each side of the cockpit. Fully loaded weight is 2440 pounds, Arland says. That's a thousand pounds over the civilian version, your basic step-side, half-ton Chenowth; the whole Baja Peninsula must be groaning in disbelief. The FAV even has front fenders. They're awful-looking things made of heavy rubber belting that would flap in the breeze if the breeze were a hurricane—well, a really strong hurricane.

The Ninth Infantry Division (Motorized) is a new kind of army unit meant to have low fly-away weight, for ease of deployment, and high mobility once it hits the ground. This is the "shoot and scoot" division, and it's going to change the way the world thinks of infantry.

Arland has a pair of green coveralls for the investigator and camo Bell helmets for both of us. A placard on the dash says: "Warning: Fasten seatbelt harness before starting." The belts are standard racer hardware, still wearing their Simpson labels. The dash has more advice: "Caution: Maximum cylinder head temperature 425°F. Caution: Maximum rpm 5000."

The engine sounds like a VeeDub—clattery, lazy, with a farty exhaust. Oil fumes drift through the cockpit. Arland finds first gear, and we chug through the weeds toward one of the many paths that cut through the maneuver grounds. We're clumping over the bumps and ruts at walking speed. The machinery seems very agricultural. He steers onto a set of tracks and, with no warning, hammers the pedal.

The FAV fishtails in first. He slams second. The synchros crunch. We're bouncing toward a bigger road and he slews right to merge onto it, throwing dirt, banging third, holding the pedal down, showing no mercy, careening over the gravel just as if the machine isn't his.

We come to another road. He catches second gear and broadslides the intersection, ricocheting off the berm. Then, apparently reconsidering, he cuts over the berm into the wild. The wheels bounce. The world turns blurry—*jud, jud, jud, dajud*—like a movie when the projector gets out of whack. The investigator feels his gizzard breaking loose from its moorings. Arland is on a mission: he has to hit every rock and hump in the whole maneuver field. The VeeDub is clattering away, and the harness straps are working into the shoulders like cheese cutters.

We're back on another road, heading for a rise, one of those whoops with nothing on the other side but sky. Arland lifts just enough to keep us out of orbit. The FAV hits hard on the down slope, takes two bounces, and splashes through a creek. Muddy water arches over the plexi, through our Bell eyeport, and dead-centers our glasses. "Oh, now I see what FAVs are all about," says the investigator. Arland is not listening. He's got places to go, weeds to flatten, arroyos to leap, viscera to dislodge.

Apparently deciding that it doesn't all have to be done today, Arland backs off a bit and heads over to where Bates and the photographer are standing. He cuts the engine and pulls off his helmet. His face is grimy and just slightly contrite.

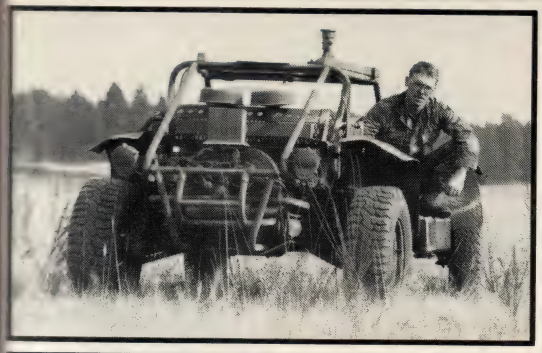
"You know that water? I shouldn't have done that," he confides to the investigator. "They teach us point-to-point driving. Pick a spot you can see, get to it, then pick another. I couldn't see over the rise, so I was supposed to slow down, but . . . " Now we recognize the look in his eyes: Joie Chitwood's guys all have it, too.

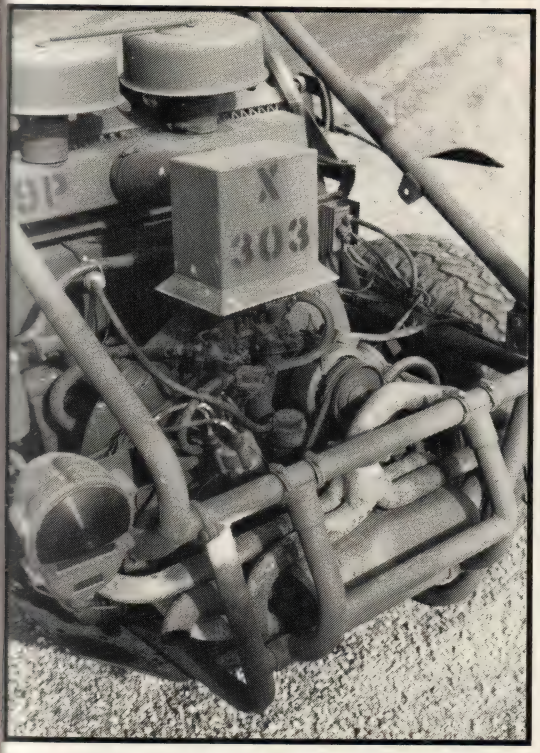
In an organization where everything comes through miles of channels before it ever sees the light of day, the unlikely nature of the FAV suggests a very unlikely channel. And that's the least you can say for the Skunk Works. If you can imagine some gang of Saturday-morning-TV kids grown up and running a 21st-century blacksmith's shop, you're getting warm. The Skunks, as they are called, come in a clump: you can't get one without getting them all. They sort of congeal now in a clump of curiosity, eager to see why these magazine guys are poking around.

Casey Cox is the chief, a plaid-shirted, outdoorsy-looking sort with a butch haircut and a goatee, going on five decades of nonconformism. He's head of the Adaptive Engineering Team, if you want to get technical about it, but everybody calls it the Skunk Works. He even produces a pancake-sized decal to that effect.

If Cox is serious about anything—and his droll way of conversation says you'd have to stick around a while to make sure—it seems to be surrounding himself with the right kinds of Skunks, guys with hobby combinations that would make the normal personnel man wary, like classical music and hand-loading .44 magnums. Cox is after guys who could make the world whole again with an arc welder if that task was on the morning's list.

He introduces his team. There's Dale Morrison, a smooth, swashbuckling sometime helicopter pilot; and Mark Evans, a mechanical engineer whose constant leer suggests some wonderful dementia; and Al Gray, whose thick glasses and rumpled





Staff Sgt. Calvin Arland is a mechanic and licensed FAV (Fast Attack Vehicle) driver. Combat effectiveness of both Arland and the FAV has yet to be proven, but they teamed up in an informal field-test session to inflict heavy damages on the person of the C/D investigator.

appearance make him look like the electronic nerd he apparently is; and Earl Barber, a physicist who has been a Skunk for only a month and therefore seems relatively normal yet. The introductions are barely over when Cox resumes needling the electroman about some "rodeo coil" he's been tinkering with, but it's soon apparent that there's pride in the poking: Gray has found a way of making a $10 part do the work of a $50 part, the sort of thing you rarely hear of in stories about military procurement.

The Skunk Works is an army operation, but only Morrison is in the army. The rest are civilians who seem to delight in their outside status—not a thread of camo on any of them.

They don't exactly take credit for the FAV; the army is too complicated for any vehicle to be attributed to just one group. And they're not a part of the Ninth, either; the army is too complicated for such a logical pairing of equipment creators and equipment users. But they are nonetheless partners on the (Motorized) venture if you forget about organization charts and just look at the practical side.

The Skunk Works sees its job as monitoring the civilian world for machinery, hardware, and technology that have been invented for civilian purposes but can be adapted to army uses—always taking into account the difficulty of making things work in the army environment. Stuff that civilians use happily may be hopeless in the army. Morrison cites the FAV's spark plugs as an example. "We never have any problems when we're driving, but we keep 'em revved up. The soldiers are usually just chugging around. Then they foul. We've got special plugs now, platinum tips, that fix the problem. They're civilian parts, too. We don't have the money to invent anything. We just try to find things we can adapt."

The FAV, of course, is a masterpiece of adaptive engineering. Part by part, the Skunks turned a dune buggy into a fighting machine. The equipment-carrying panniers on each side double as guard beams in sideswipes with trees. The fiberglass hood not only keeps the mud out but gives the gunner a place to stand when he's firing backward. The electrical system has been switched to 12-and-24-volt so that it can power military radios. The Skunks are forever getting an idea, then trying it. Cox recalls the fat-tire test: they wanted to see if the FAV would float. "Front did, back didn't," he says.

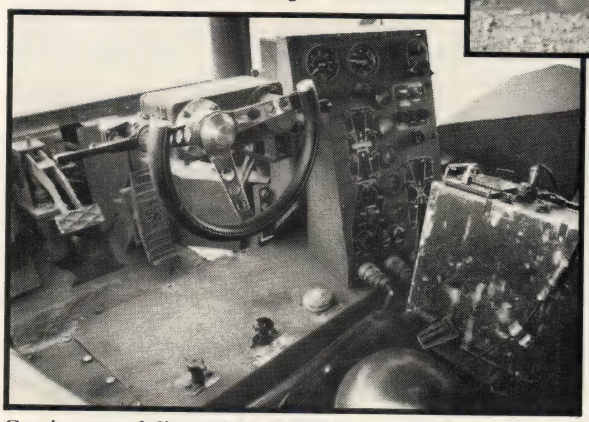
Skunk Works testing programs tend to be like that: quick and dirty. About the most sophisticated tool in the box is their video camera. When they're out crashing through the boondocks, they tape the action. Just when your investigator has concluded that this is meant purely to provide coffee-break entertainment, Cox inserts a tape of some FAV trailer-pulling trials. The Skunks have developed a quick-loading trailer for hauling a heavy mortar in one piece rather than breaking it down, which will save a lot of minutes on a fast deployment. The FAV and the trailer leap across the screen like ballet dancers, beautifully sure-footed and agile. The trailer is as steady as a plume of smoke. Cox says they watched the early trials in slow motion so they could analyze the problems. "Not too hard to fix when you can see exactly what it's doing wrong," he says.

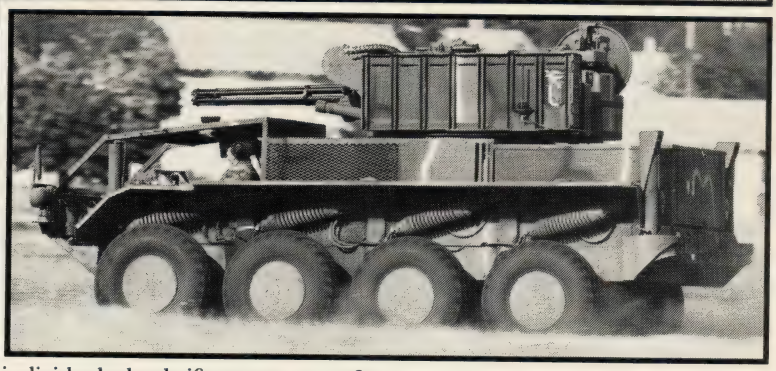
Results, not glossy procedures, are the product of the Skunk Works. The Skunks don't make much of their position in the military-industrial complex, and surely the complex takes little notice of them. But they do regard the FAV with a special joy. Morrison speaks of the Fort Bliss tests: "After dark, the FAVs were in control. The tanks use infrared to see heat. It's real good now. They can look at a tent and see warm bodies inside. But our air-cooled engine cools off fast. And it's low, so you can hide it behind a little rise. They couldn't find us. But we could find them." Morrison isn't grinning exactly, but it's obvious he appreciates the technical craftiness of a dune buggy gone to war.

Little by little it becomes clear why the Vulcan Wheel Carrier is being saved for last. The Ninth is quite pleased with this thing for a thick folder full of reasons, not the least of which is the speed with which it has proven itself. Car enthusiasts complain about the five-year lead times in Detroit; with the military's ponderous bureaucracy, hobbled further by second-guessing in the Congress, twice that is not uncommon in the army. But the Ninth is a part of a special fast track around the typical army procurement process. According to General Pihl, committees thinking up solutions to problems never know when to stop thinking. The Ninth favors the action approach: get equipment into the hands of the soldiers as soon as possible. "They'll tell you if it works or not," he says. "They don't have any stock in the company."

The first prototype of the Vulcan Wheel

This eight-wheel land speeder started life as a piece of construction equipment and was later adapted to carry the Vulcan antiaircraft gun. It's still in the trial stage—only five prototypes exist—but its cushy ride is said to have cut substantially the need for gun maintenance.





Carrier was delivered—at the expense of its maker, the Standard Manufacturing Company—just two years ago. The army was so impressed that it ordered four more, each to be equipped with the same 36-by-12.5–16.5 Goodyear Wranglers and 6.2-liter GM diesel as the HMMWV. And one of these four is parked in the middle of a grassy drill field right now, waiting for us.

This thing would be love at first sight for a wheel fetishist. It's hunkered down on eight wheels, four on each side, looking like a tank meant for golf-course work. Staff Sgt. Stephen Dupuis is in charge, and when he's finished with this little demo he's going to high-tail it to the Yakima proving ground for more testing.

Dupuis is proof that a uniform doesn't have to squelch a man's style. The top of his camo cap rolls into a Stetson-like crown in front, and the non-glare black insignia on his collar are worn through to brass on the edges. He moves around the machine with a swagger, telling us about its systems and capabilities.

It has hydrostatic drive. No gears. The engine runs at a constant speed of 3600 rpm, driving three pumps: left side, right side, and accessories. Hydraulic pressure is 6000 psi, and the gas pedal controls the amount of fluid pumped to the motor in each wheel. The machine will do 45 mph on the road; 45 off the road too, though it's rated for only 30.

Each wheel mounts on its own trailing arm. You can run the machine high or run it low, just by the angle of the arms. Or you can pick up individual wheels if you want; there is a switch for each one.

The driver can choose one of three running modes with the ECS (Electronic Control System): "City" raises the four corner wheels, balancing the 12,600-pound (empty) weight on the closely spaced center wheels for easy maneuverability; "Select" allows individual wheels to be raised; and "Normal" automatically lifts the corner wheels for turns, then lowers them again in the straights.

The CTI (Central Tire Inflation) system allows the driver to drop the tire pressure if he needs flotation, then raise it again, without ever stopping. Flat tires can be kept inflated this way, too. Or the driver can use the ETS to lift a flat off the ground and keep on going.

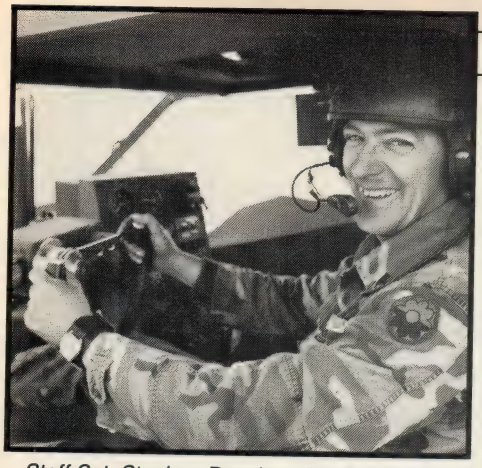
Dupuis is a walking owner's manual for this thing. He crawls on top to show us the Vulcan gun. This is a rapid-fire 20mm piece meant for downing aircraft. "Thirty rounds in 1.76 seconds," he says. "You shoot up a wall of ammo and they cut their throats on it."

The army now has track-mounted Vulcan guns and towed Vulcan guns. The towed one takes five minutes to get into operation; this one takes fifteen seconds. And you can fire on the move. "Gun maintenance has gone to zero, too," Dupuis says, pointing out that the wheel carrier doesn't thrash the aiming electronics into a box of loose connections.

The more Dupuis talks, the more he seems too good to be true, exactly the kind of guy we all hope is on duty defending our country, even though the newspapers insist the volunteer army is mostly high-school dropouts. His swagger is pure job satisfaction. He loves what he's doing, he thinks the Vulcan Wheel Carrier is the greatest thing since the hot-fudge sundae, and he's ready to take someone for a ride.

The driver sits in the left front corner, holding a steering wheel we've all seen in low-budget hot rods, except that this one has the top third of the rim chopped out. The commander, when there is one, sits in the right front. Crawling in under the overhead tubing is much like head-firsting into a NASCAR stocker. There are CVC (Combat Vehicle Crewman) helmets for both of us, equipped with boom mikes. Dupuis warns that this machine will sound funny. "The engine doesn't change rpm with speed, and sometimes you'll hear a nasty clatter. That's the CTI compressor when it goes into bypass."

Some switches get flipped, some pedals get pushed, and we're moving—slowly, then not so slowly. Dupuis has the suspension full up, and we're floating over the rises and falls of the field, no place to go but making good time. The mirrors quiver. With no windshield, the wind is a faceful. The compressor hammers away, then stops, then starts again. At the end of the field Dupuis steers a big, graceful left, motors across the grass for a while, then bends another left, heading downfield again. The ride is remarkable—no impacts, just up and down, up and down, a



Staff Sgt. Stephen Dupuis, soldiering in style.

big camo-green marshmallow scuttling over the grass. No wonder Dupuis likes this thing.

The intercom breaks through the diesel rush. It's Dupuis, talking slow and easy like some airliner captain. "Standard Manufacturing says you can't turn this thing over—and we have a tendency to believe that." But instead of putting a period on his statement, he cocks the marshmallow sideways into a big drift. The engine groans. The horizon lists at a jaunty angle. The tires claw through the grass to black dust, and we head back into our own cloud. "Dead turnaround at 30 mph," says the intercom. "Pretty good.

"You can learn to drive in a day," he adds. "Be an expert in a week. It's not like a helicopter."

When we're stopped and the engine is off, he's still spewing information. "The ammo racks on top will hold 2550 rounds. Full crew, ammo, gear, and fuel take the weight to 17,000 pounds.

"Notice the flat plates over the wheels. Those protect the CTI lines; nothing'll catch on 'em. That's something we asked for. You can have four tires out and still keep on going."

Trying to find some flaw in the machine, the investigator asks, "What about four on one side?"

"Well . . ." He hesitates, his mind skimming through the manual. Then a wry grin forms. "I guess you're tits up."

But he's not worried about tires. He's run them with machine-gun cartridge cases punched through their carcasses, and the CTI can handle that. What he's worried about is the Congress. What if it doesn't buy the program? All the Ninth has now is prototypes.

The investigator recalls General Pihl's method for finding out if the Ninth's equipment is more than just a fanciful idea: let the soldiers try it, because they have no vested interests. By that logic, what we've been hearing is an eloquent endorsement of the Vulcan Wheel Carrier by a guy who should know.

Dupuis has been in the army for eleven years. Will he re-up if the project is cut? "Oh, I think they've got me anyway," he says. "It'd be good, though." ●

Driving the High-Mobility Multi-Purpose Wheeled Vehicle

You can call it "HMMWV."

• If you're worried about waking up some morning and hearing that the Commies have achieved superiority in transmission tunnels, forget it. No chance. The new HMMWV has them all covered.

Work yourself into the driver's seat. It's nothing but foam-and-vinyl-covered slabs of metal, so narrow there's not even room beside you for the shadow of your elbows. Then look across the tunnel at your buddy on the passenger's side. It's like looking across Nebraska. And there's nothing between the two of you but tunnel. The HMMWV is 85 inches wide—that's an inch over seven feet, a hand wider than a Cadillac from the big-car era—and most of that width is tunnel.

The tunnel, in fact, is the key to the HMMWV's success. This is an "off-road combat vehicle" first and foremost. The army wanted 16 inches of ground clearance, it wanted the capability of fording in 30 inches of water with no modifications, it wanted 60-degree gradability, and it wanted sidehill stability on 40-degree slopes—not to mention the ability to drive over land mines without taking a fatal wound in the vitals. So all the machinery was pulled up out of harm's way and tucked into a tunnel that's small only when compared with the Holland.

The result is a vehicle that could straddle a fireplug and not even make a scratching sound. And even if it did, you probably wouldn't hear it over the clatter of its 6.2-liter GM diesel V-8.

This is a four-wheeler to trump anything in the neighborhood. The engine is set back behind the front wheels to help even out the weight distribution. Ground clearance is aided by geared hubs that provide about five inches of drop below the center lines of the halfshafts. The disc brakes are inboard on all corners, and an extra one on the nose of the rear diff serves as a parking brake.

The four-wheel drive is full-time, of course. The center differential can be locked with a lever beside the driver, while the front and rear diffs have Gleason limited-slips. The transmission is a GM three-speed automatic. Power steering and power brakes are standard equipment.

Just driving a HMMWV around is less fun than we hoped. The brakes are very touchy, the steering-wheel rim is unfashionably skinny, there's way too much air leakage around the fabric top, and you have to cancel your own turn signals. Moreover, an unloaded HMMWV takes life's small bumps as if it had cement in its tires.

But that's judging it by the car yardstick. As off-road combat vehicles go, this one is remarkable. Probably the masses, used to the jeep, will lament its lack of cuteness. The jeep is a little sweetie, something to lust after in the army-surplus listings. Now the HMMWV is replacing it—at least in the sense that the military is no longer ordering the M151A2-series jeep, buying instead the M998-series "HMMWV."

But the truth is that the job of the vehicle has been redefined, and the HMMWV is the new answer. The HMMWV is much bigger, a one-and-a-quarter-ton hauler, while the jeep is rated at only a quarter-ton. The HMMWV has nine more inches of fording depth and nearly twice the ground clearance. A single HMMWV will support a TOW-missile team, a mission that formerly required two jeeps and a trailer.

A jeep is a jeep, but a HMMWV is really a system. The same basic machinery is available in fifteen different body configurations, ranging from the pared-down two-door cargo/troop carrier, with a flat bed in back, to enclosed armament carriers, mobile electronics units, and ambulances.

The manufacturer is AM General, which built most of the military jeeps. Production started in January 1985 on a five-year contract worth $1.2 billion for a minimum of 55,000 vehicles. Orders from abroad are expected this year.

A civilian version, however, is extremely unlikely. Even if it could be made to pass federal standards—from which military vehicles are exempt—the width would still be a bit much. Maybe you could squeeze a HMMWV into your garage, but then how would you open its doors? —*PB*

Vehicle type: front-engine, four-wheel-drive, 4-passenger, 2- or 4-door truck	
Price: $19,000 (approximate)	
Engine type: diesel V-8, iron block and heads, fuel injection	
Displacement	379 cu in, 6217cc
Power (SAE net)	150 bhp @ 3600 rpm
Transmission	3-speed automatic
Wheelbase	130.0 in
Width	85.0 in
Length	180.0 in
Curb weight	5150 lb
Manufacturer's performance ratings:	
Zero to 60 mph	20.0 sec
Top speed	79 mph

Thirty-eight years ago, Professor Ferdinand Porsche and his son, Ferry, built the first cars to bear the family name.

As a direct result, Porsche enthusiasts of today are subject to a recurring dream. Which goes something like this:

After running out of gas on a remote country road, you hike over to a distant farmhouse, knock on the door and ask an old man with a weathered face if he has some gas you can buy.

"Sure," he says. Out in the barn, as he sets to work with gas can and siphon, something in the shadows catches your eye.

There—enshrouded in dust, sitting lopsided on a time-flattened tire—is a 1958 Porsche 356 Speedster. Left behind 25 years earlier, you discover, by a son on his way to boot camp and a subsequent commitment to marriage, family and a station wagon.

Nonchalantly, you walk around it, examine it, and realize that, under the dust, nothing is missing. It's all there. Waiting.

"Never got around to selling it," the old man says.

"Oh?" you reply, stifling the urge to hug a perfect stranger. "I might be interested."

"You would, eh? $500 be too much?"

And then you wake up.

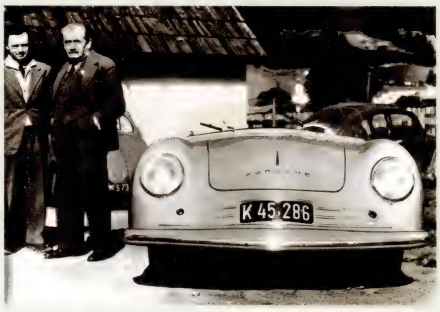
Porsches change. What makes them Porsches doesn't.

What is it about a decades-old Porsche that makes it so very desirable—even with the $15,000-plus price tag such a car is more likely to command these days?

Horsepower? Handling? Top speed?

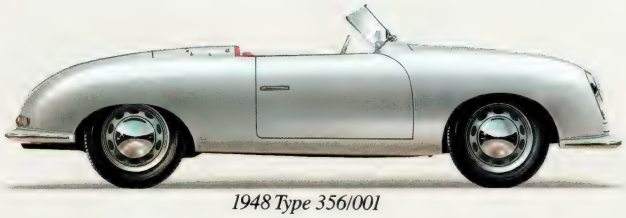
None of the above.

Its true value lies in the total commitment of two uncompromising men to build cars that would be more than simply a means of getting from one place to another. Cars that would be a joy to drive. Cars like no one else had ever built. Or ever would.



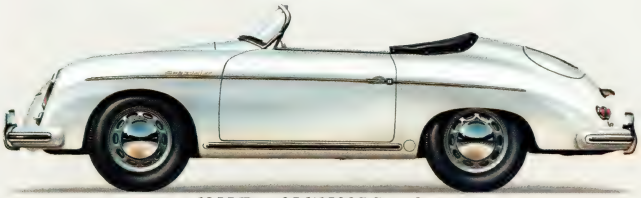
This commitment has been passed on successfully—some might say miraculously—to the uncompromising people who build Porsches today.

The workers on the Zuffenhausen assembly line who, in their off-hours, have been known to grab their



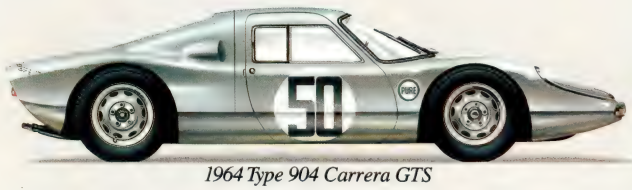
1948 Type 356/001

1949 Type 356/2 Cabriolet

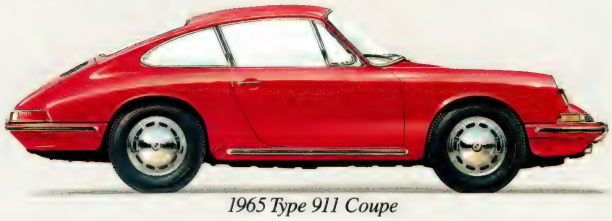


1955 Type 356/1500S Speedster

1958 Type 718/1500 RSK Sebring Spyder



1964 Type 904 Carrera GTS



1965 Type 911 Coupe

1969 Type 908/02 "Flounder" Spyder

1973 Type 917/30 Spyder

1978 Type 935 "Moby Dick"

1978 Type 936 Spyder

friends, point at a passing Porsche and say with genuine pride, "That's one of mine."

The quality control technicians—one for every ten production workers—whose goal is to take the ideal of "zero defects" and make it a daily reality.

And, of course, the engineers at our R&D facility at Weissach.

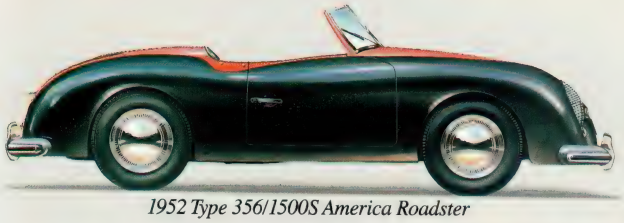
For them, the pursuit of excellence will never fit comfortably between the hours of 8 and 5. Or within the theoretical vacuum of an air-conditioned office.

For them, theories have value only on the inside of a Porsche, at speed, on the Weissach test track—preferably with one of them behind the wheel.

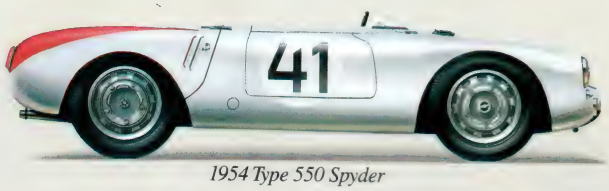
The results of their labors, and the extent of their success, is reflected in the procession of cars you see below.

From the first recorded Porsche win on July 11, 1948 at Innsbruck to the most recent victory at Le Mans, these cars have dominated the racing circuits of a world that loves fast cars.

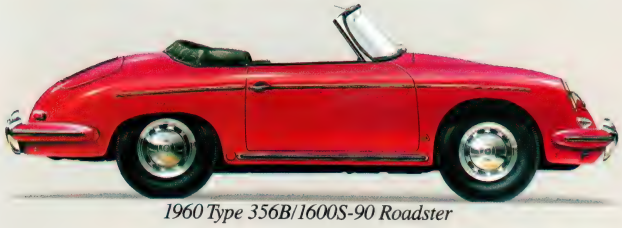
As they have dominated the highways, turnpikes, interstates, autobahns, city streets and winding back roads of a world that loves to drive them.



1952 Type 356/1500S America Roadster



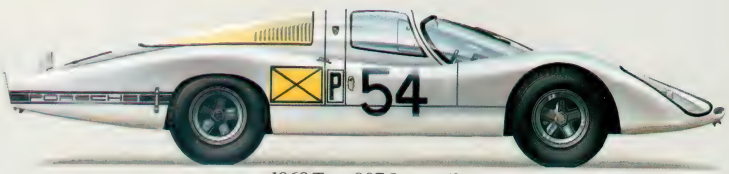
1954 Type 550 Spyder



1960 Type 356B/1600S-90 Roadster

1960 Type 356B/1600GS Carrera GTL Abarth

1966 Type 906 Carrera 6



1968 Type 907 Longtail

1974 Type 911 Carrera RSR Turbo

1978 Type 928

1980 Type 924 Carrera GT

1984 Type 962

We've spent the last 23 years working on the same idea.

If there's one thing which, more than any other, characterizes Porsche's approach to building sports cars, it's our preoccupation with making every 911 demonstrably better than it was the year before.

While adhering to a styling concept so unarguably "right" that it has remained essentially unchanged since it was first introduced in 1963.

Even the 282-horsepower, 157 mph, top-of-the-line Turbo shown here, with it's radical "whale-tail" spoiler and considerably flared rear wheel wells, is unmistakably a 911.

Today, the 911 is perhaps the most coveted high-performance sports car in the world. A 23-year beneficiary of everything we've learned in world class endurance and sprint racing.

Built, as is every Porsche, with a precision and attention to detail that's quickly

vanishing in this age of rampant robotics.

The legendary air-cooled, horizontally opposed, six-cylinder, fuel-injected engine is still hand assembled by a small team of workers, any one of whom is qualified to build the entire engine from scratch.

It's still bench tested for 45 minutes at maximum rpm. By an increasingly rare breed of technician whose gloved hand, strategically placed on a running engine, is as good a judge of quality as most of his sophisticated monitoring equipment.

At the end of the assembly line, every 911, as is every Porsche, is test driven for at least 30 kilometers on both city streets and no-speed-limit autobahns.

Everything is checked. Chassis, body, engine, transmission, suspension, brakes, paint, interior finish, everything.

Any fault they uncover, no matter how minor, is located and fixed, and the car driven again before it is released.

At Porsche, we take a great deal of pride in the fact that every new car we sell is slightly used.

911 Turbo *6-cylinder, horizontally opposed, two overhead camshafts, air-cooled rear engine with turbocharger and intercooler, 3299cc, 282 hp. Weight: 2976 lbs. Top speed: 157 mph.*

Many of our future discoveries will be made in this laboratory.

These days, they say, it's possible to duplicate anything in a laboratory.

Anything, perhaps, except the way your latest technology is likely to perform in a car driven by an actual human being.

For that you need the car. And the human being.

A rolling laboratory, if you will.

Precisely the role of the technological wonder revealed, quite literally, below.

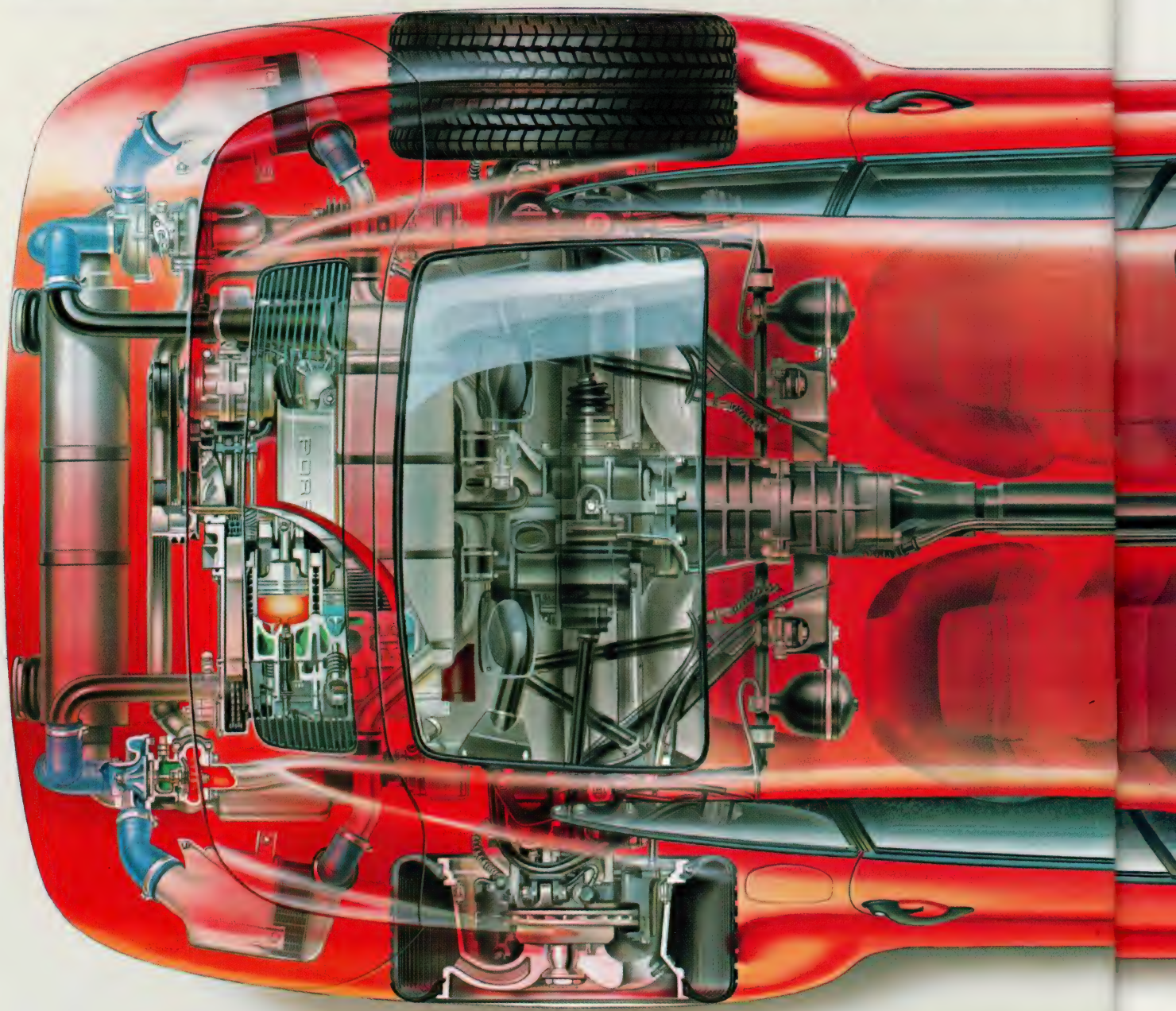
The Porsche 959.

A 190+ mph laboratory in which we are re-shaping and redefining what a sports car ought to be.

Consider the following:

A 450 horsepower, 6-cylinder, horizontally opposed, twin-turbocharged engine not unlike the one found in our 962C endurance racer.

An all-wheel drive system that's so



959 *6-cylinder, horizontally opposed, four overhead camshafts, four valves per cylinder, water/air-cooled rear engine with twin*

sophisticated, it continually and electronically monitors throttle application, speed and road conditions, and adjusts both front and rear torque accordingly.

A suspension system that automatically stiffens the shocks and lowers the car as speed increases, to maximize aerodynamic efficiency and minimize lift.

Body panels made of Kevlar, a space-age material with twice the strength of steel. And half the weight of aluminum.

The Porsche of the future?

Perhaps. Perhaps not.

It doesn't really matter.

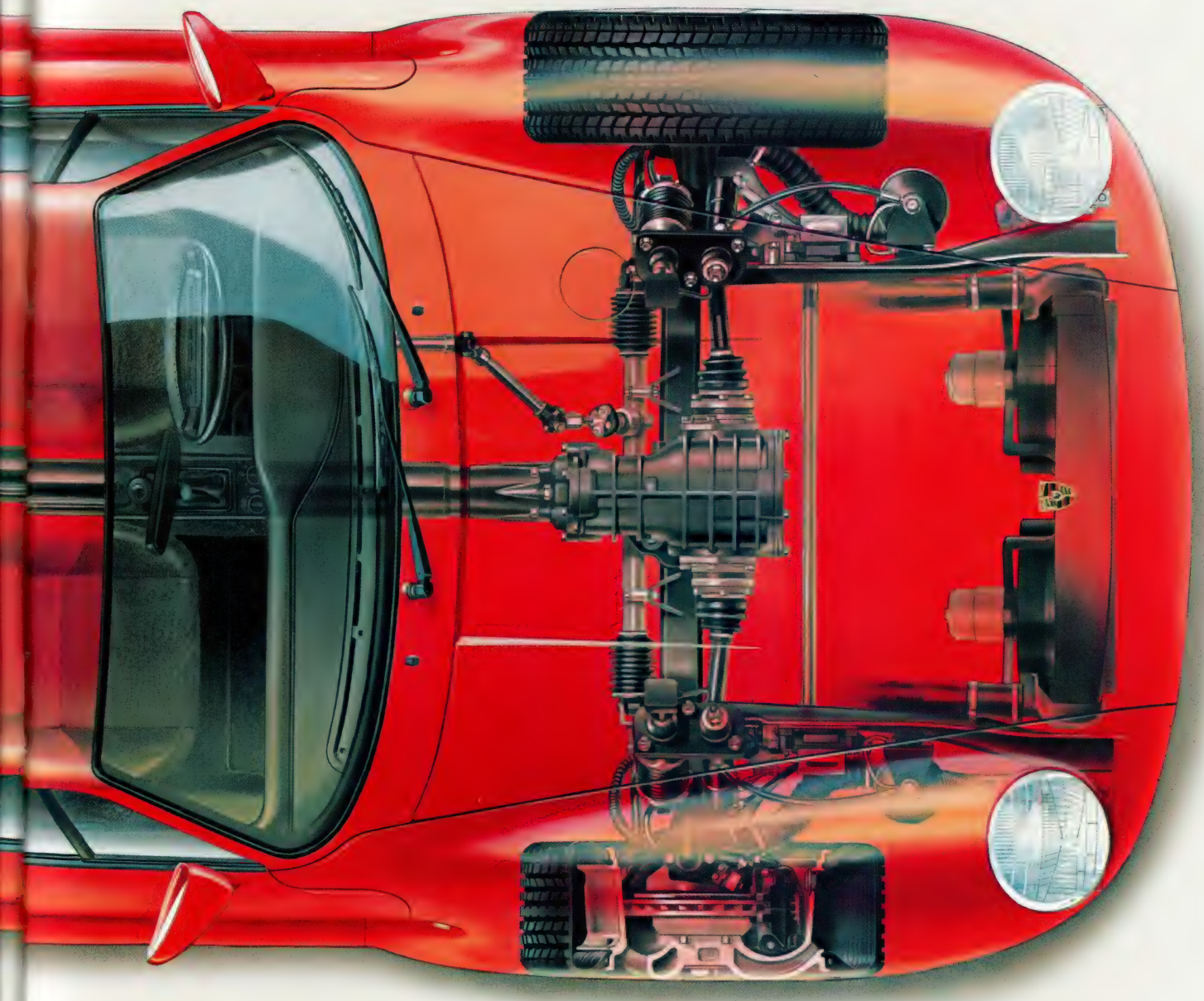
Because as perfect as the 959 might become, for us it will still only be the next step.

Which is not too surprising a thought when you consider a conversation that once took place between Professor Porsche and a certain visitor.

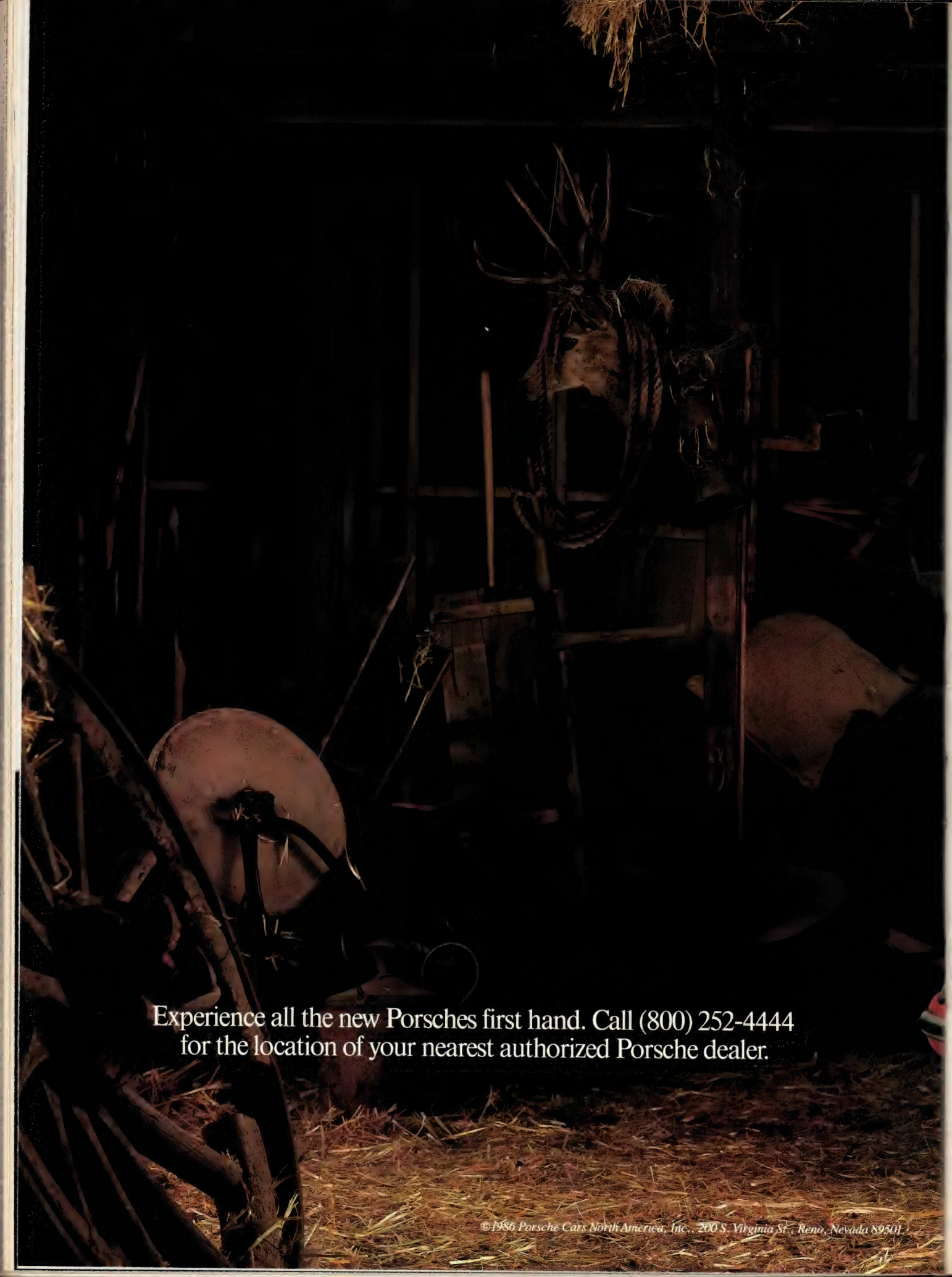
The visitor said, "Tell me, Professor, which is your favorite Porsche?"

The Professor replied. "We haven't built it yet."

PORSCHE®



turbochargers and intercoolers. 2850cc, 450 hp. Estimated Top Speed: 190+ mph. A test vehicle, not currently available.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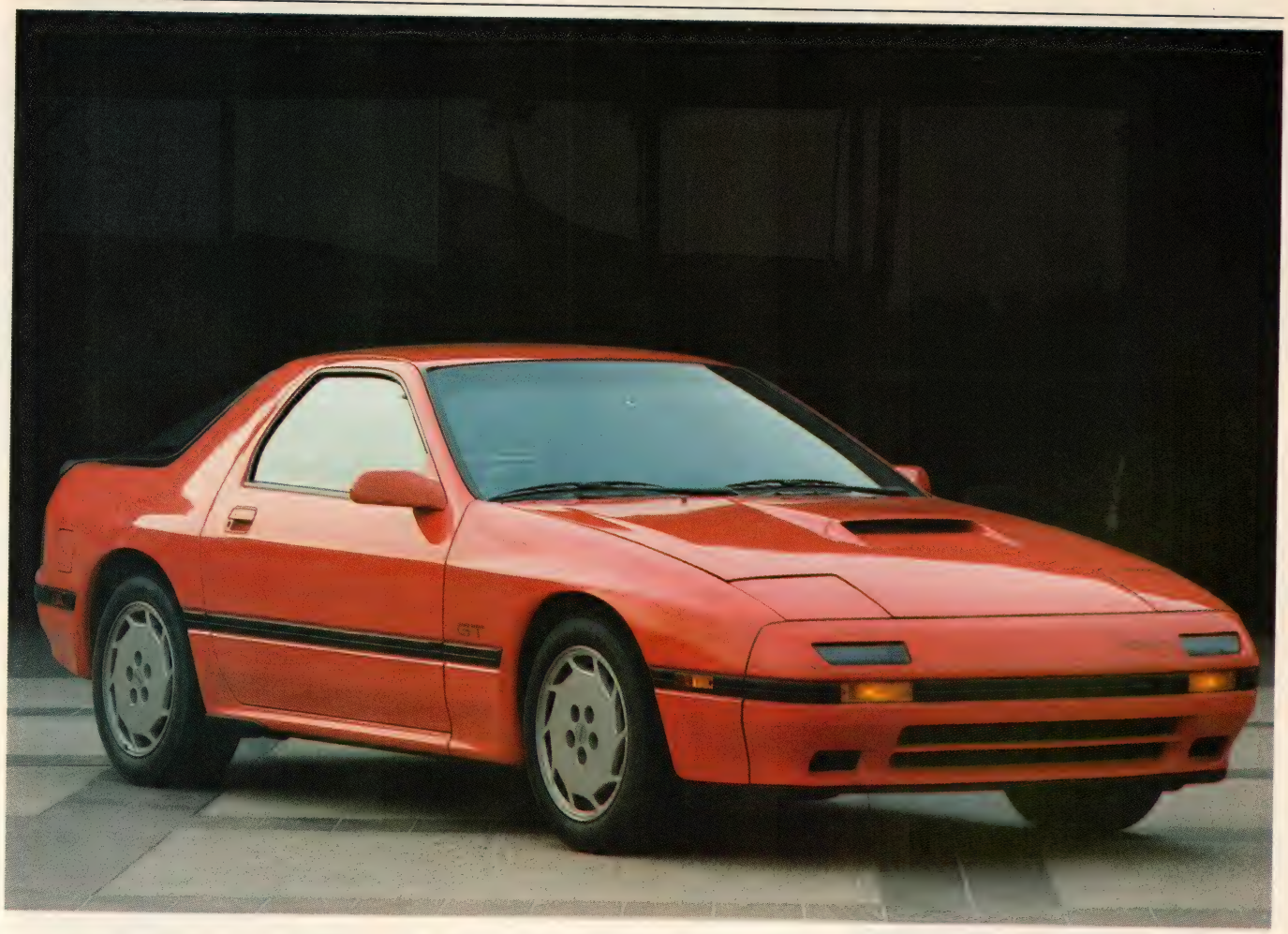


Mazda RX-7 Turbo

True to the faith.

• You can always tell when a company is being run by the good guys. Good guys don't pull their punches. Good guys give you a straight shuffle and a square deal. Good guys are true to their convictions; they don't swing with the winds of fashion or go soft in the head when they get successful. Good guys, cast in the mold of the best of them, the Duke, can always be counted on to be consistent. They may not always be right, but you know where they're coming from. You knew when the Duke went home at night that he didn't slide out of his buckskins and into a gold-lamé jumpsuit and head for the disco. The guy was true to his ethic.

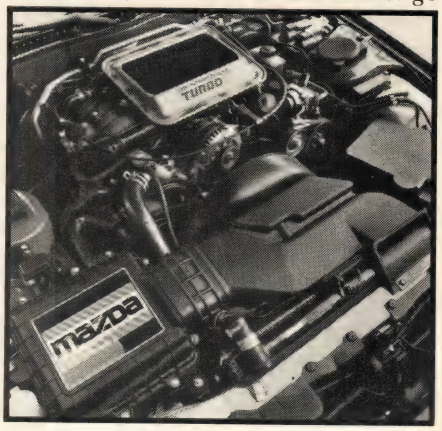
Unlike the Duke, some car companies do on occasion slide into some gold lamé. We don't want to name names, but—oh, what the hell, Nissan is one of them. Here's a bunch of guys who had a really good thing in the Z-car. When the company was young, lean, and scrappy, so was the car. But then Nissan got big and prosperous, and the Z-car took the first off-ramp to Studio 54. Crisp handling took a back seat to silver-and-blue GoBot color schemes. A back-road interceptor was allowed to get fat and lazy, and today it has a hard time finding its way off the boulevard.

In contrast, when you look at Mazda's history, specifically that of the RX-7, you're not going to find gold chains, crushed electroluminescent velour, or the kicked-back attitude often associated with prosperity.

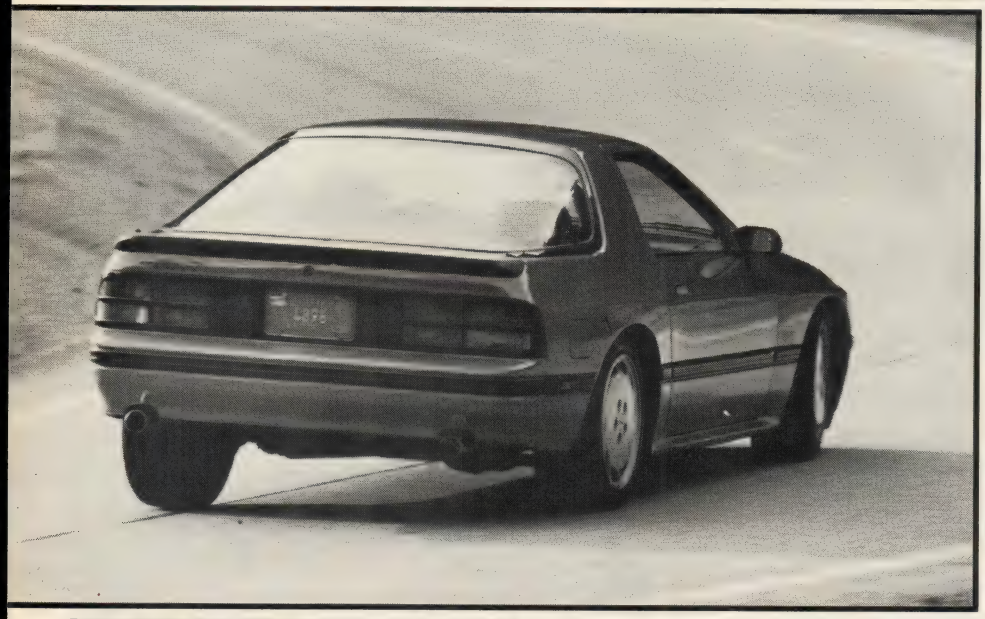
Following on the heels of the all-new, normally aspirated RX-7, Mazda has quickly upped the ante with the inevitable turbocharged version. One might even argue that the Turbo has been introduced a little too quickly. For instance, as this is being written, the car's name is not yet certain. It may be called the GT, or maybe the Turbo, or maybe something else. Other matters are also unsettled, such as the standard-equipment package. Depending on the yen-dollar exchange rate, the Turbo may include power windows, power mirrors, a sunroof, and a high-buck radio as standard equipment. Or it may not.

Our test car, though by no means a stripper, was virtually devoid of power accessories—which served to its advantage. Fewer frills equal less weight, and less weight means more fun. And with the Turbo RX-7, fun is precisely the point.

The previous-generation RX-7s were never accused of not being fun. Sometimes they provided more fun than you were ready to handle, like when you pointed the car left and the rear axle tried to go



PHOTOGRAPHY BY DAVID DEWHURST



right. But in spite of its occasionally squirrelly behavior, the old RX-7 was always a genuine, no-artificial-ingredients-added sports car. It was elemental. There was no mistaking it for a "personal-luxury sports coupe" or a quasi sports GT, or a boulevard dandy in sports-car camouflage. Despite its faults, few though they were, you had to respect the original RX-7's purity.

With the arrival of the Turbo, Mazda has proved that among Japanese sports cars, the RX-7 has no equal. Its purity of intent and function has been retained. The pretenders and poseurs are kindly requested to park it at the curb. You German chauvinists in the audience should also listen up, because it looks as if Kenichi Yamamoto and company have just served you notice as well.

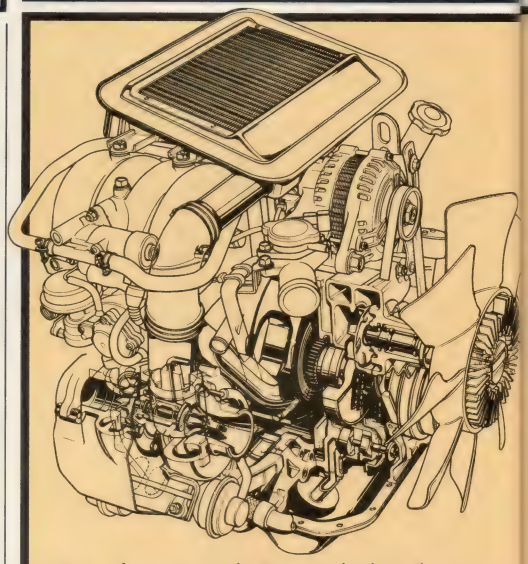
These are the facts of the matter: The Turbo hammers from zero to sixty in 6.5 seconds; that's but a half-second slower than a 944 Turbo. The quarter-mile goes by in 14.9 seconds at 94 mph; the 944 Turbo does it in 14.5 at 97 mph. The RX-7 Turbo generates 0.84 g on the skidpad; the Porsche turned in a mere 0.80 g in our December 1985 test. (Even the revived 911 Turbo can't generate more than 0.82 g.) The 944 Turbo gets the edge in top speed at 157 mph; the RX-7 Turbo hangs in there at 145. Nothing else from Japan even comes close. Before we forget, one further disparity between the Porsche and the RX-7 is the $11,000 difference in price. Guess which is cheaper. What you have here is a world-class performance machine that doesn't require a world-class bank balance to own.

Like the very best machinery of any kind, the Turbo minimizes your orientation period. From the minute you take possession of the wheel, you're plugged in and ready for your first mission. You're presented with a dashboard layout that is as functional and crisply styled as that of any major Teutonic hitter you'd care to name. There isn't the slightest hint of quirkiness anywhere. At night, everything on the dash lights up. We mean everything. The major gauges, in fact, are lit up twice, from both front and rear.

The relationship of the deeply bolstered seats, the thick, leather-wrapped, three-spoke steering wheel, and the pedals is just about ideal. There's no mistaking the purpose of this car. As the song says, this ain't no disco, this ain't no foolin' around. This car is meant to be driven, pal.

On first acquaintance, the ride feels harsh. It's nowhere near as harsh as the Corvette's used to be, but it is noticeably stiff. Little bumps and rain grooves seem to bypass the suspension and be transmitted directly into the chassis. By the time you get the first taste of turbocharged rotary power, though, the minor annoyances of its stiff legs are forgotten.

You can also forget everything you've heard about turbos and rotaries being gutless in the lower part of the rev range. Boost lag is minimal. In addition, the 13B turbo engine makes 22 percent more

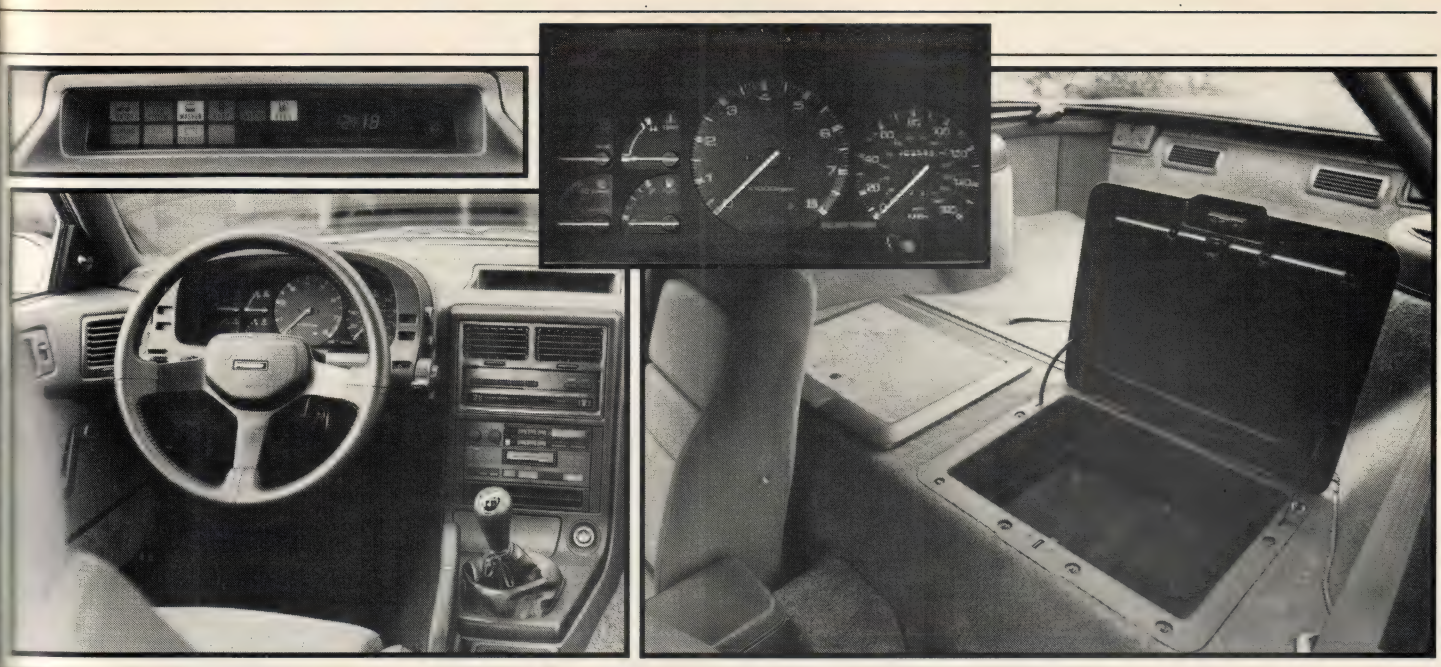


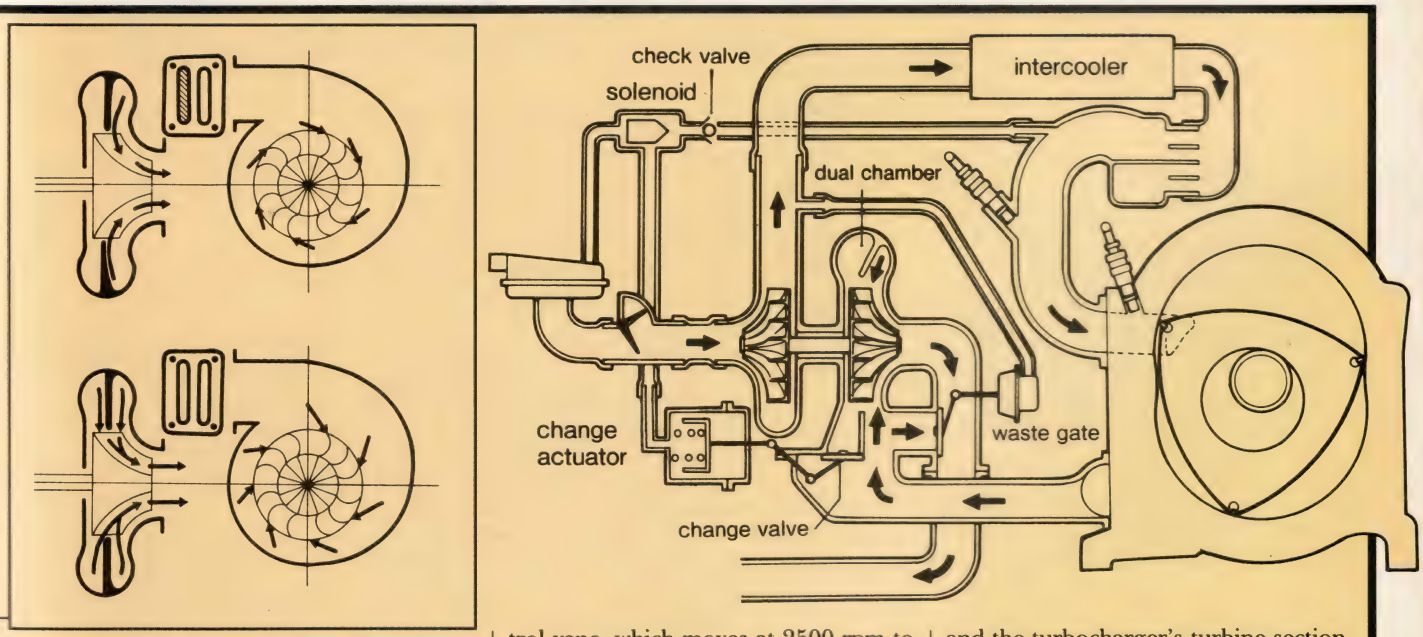
Technical Highlights

• Mazda engineers have demonstrated considerable ingenuity in bringing their rotary engine to its current state of development. For the normally aspirated 1986 RX-7, clever manifold tuning and creative multiport designs did much to fatten the power band of the 13B engine. Similarly, Mazda's first turbocharged rotary for America brings us another load of fresh technology.

The blown 13B is unique in having a variable-geometry turbocharger, which is aimed at reducing turbo lag and improving low-rpm boost. Designated HT18S-2S and developed in cooperation with Hitachi, this turbo has two separate passageways—called scrolls—to direct the engine's exhaust gases against the turbine. A simple movable vane can direct the exhaust flow either through the primary scroll alone or through both scrolls together.

The primary scroll has an A/R ratio





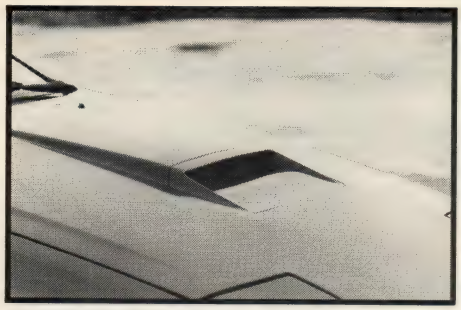
The RX-7 Turbo's twin-scroll turbocharger uses only its small primary turbine scroll at low rpm (top), but both turbine scrolls at high rpm (bottom), to generate good boost pressure over a wide range of engine speeds with minimal exhaust restriction.

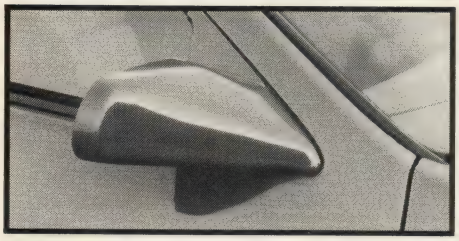
(the area of the throat divided by its distance from the center of the turbine wheel) of 0.40, which is unusually small for an engine of the 13B's power output. With a small scroll, even the limited flow of exhaust gas that is produced at low engine speeds is directed forcefully against the turbine, spinning it quickly to operating speed, thus providing low-rpm boost and minimizing turbo lag. At high rpm, however, the exhaust-gas flow increases so dramatically that a small scroll can become a major restriction, increasing back pressure and reducing power. The Mazda-Hitachi dual-scroll design solves this problem with its control vane, which moves at 2500 rpm to direct the exhaust flow through both scrolls. Together they have a combined A/R ratio of 1.0, which is large enough to accommodate the rotary's exhaust flow up to 7000 rpm without much sacrificial back pressure. To make the most of the dual-scroll design, the blades of the exhaust turbine have both straight and curved segments to match the different flow patterns produced by the two scrolls.

Despite the dual-scroll design, a conventional waste gate is still necessary to limit maximum boost, which is 6.2 psi. However, the broad torque band of the turbocharged rotary eliminates the need for the exhaust-pressure-controlled third intake ports of the normally aspirated RX-7 engine. The turbo engine also uses single- rather than multiple-chamber exhaust-port liners, reducing the restriction between the powerplant and the turbocharger's turbine section.

In most other respects, Mazda's turbo rotary is similar to sophisticated turbocharged piston engines. It has an intercooler to reduce the temperature and increase the density of the intake charge. The compression ratio has been reduced from 9.4 to 8.5:1 for improved knock resistance, and a detonation sensor has been added to the engine-control system to eliminate knock.

The result of these efforts is 182 hp at 6500 rpm and 183 pounds-feet of torque at 3500 rpm. Not only are these peak figures substantially higher than the naturally aspirated engine's 146 hp and 138 pounds-feet, but the turbo engine exceeds the normally aspirated engine's torque from 1500 to 7000 rpm and fuel economy is virtually unchanged. With results like these, it's no wonder that Mazda's engineers continue to innovate. *—Csaba Csere*





torque at 1500 rpm than the normally aspirated 13B, and the curve stays nearly flat through the entire range. Punch the throttle in any gear and the thing just lifts off and flies. When you approach the 7000-rpm redline, the over-rev chime warns you to shift up and do it again.

On the freeway you feel positively invincible. Let's face it: there isn't a whole lot out there that can stay with you. The first time you double the suggested off-ramp speed, you wonder if this car comes from the same people that made the old RX-7. Where the previous model took a heartbeat or three to settle into a corner, this monster dives in with fearless abandon. The steering is absolutely linear, and the effort grows proportionately with cornering force. There's virtually no body roll as the massive sixteen-inch Goodyear Eagles sink their talons into the pavement.

Mazda solved the old car's tail-wagging problems with an approach that borders on overkill. The engineers invented what they call a triaxial floating hub for the rear suspension; it permits the rear wheels to toe out during low-g cornering (less than 0.4) and toe in during high-g maneuvers (more than 0.5). The rear wheels also toe in during deceleration, whether it's produced by the brakes or by the engine. All this translates into the kind of razor-sharp performance that until now has been the exclusive province of very expensive German iron and the almighty Corvette.

The one aspect of our test car's performance that was less than awe-inspiring was its braking. Frankly, with those four-pot front calipers and the trick new suspension, we expected better than a 193-foot stopping distance from 70 mph. Modulation was also poor, and the balance was too heavily biased toward the front axle. Since our car was one of the very early preproduction models, we suspect we drew one with less-than-perfect brakes.

Fortunately, the shortcomings in the Turbo's braking system had no particularly adverse effects on the rest of the chassis. A tap on the brakes during hard cornering brought only a mild deviation from course. In the old car, a similar move occasionally bought you a first-class ticket to Club Opposite Lock. You have to try really, really hard to get the Turbo crossed up.

It should be fairly obvious that the RX-7 Turbo (or GT, or whatever) has made a strong impression around here. It's got power (lots of it), looks, and the kind of taut handling that will plaster a smile across your face every time you dive for an apex. Some cars are more competent in certain areas, but you have to measure their edge with calipers, not a yardstick. Use the yardstick to measure the difference in price between the RX-7 Turbo and its competition.

Sports-car fans should be grateful to the good guys at Mazda as much for what they haven't done as for what they have. They could have turned the RX-7 into a precious, overweight gigolo. Instead, like good guys everywhere, they have kept the faith. The result is a fast and furious streetfighter with the legs and lungs to stick it in the face of much of the expensive iron trolling the avenues. —*Tony Assenza*

CAVALIER Z24

A fox raised by wolves.

A new Z is brought forth, a hybrid of the classic bloodline. Inspired by the handling of Corvette's Z51 suspension. Following in the heritage of Camaro Z28.

Introducing Cavalier Z24. Born under a cold, white moon. Multi-port fuel-injected V6 power. Super-tuned sport suspension is unleashed. Big, mean 14" rubber ready to pounce.

Beware the Z24. Cavalier's running with the big boys now.

TODAY'S CHEVROLET Live it!

THE NEW BMW ELECTRONIC TRANSMISSION. IT NOT ONLY SHIFTS GEARS. IT SHIFTS PERSONALITIES.

The trouble with conventional automatic transmissions is they don't just change gears automatically. They also automatically limit your options. By shifting at the same points—regardless of driving conditions.

The new BMW electronic transmission, on the other hand, displays an uncanny ability to shift with changing circumstances. Because its microprocessors are programmed to work in concert with BMW's electronic engine management system, shifting at different points depending on your requirements.

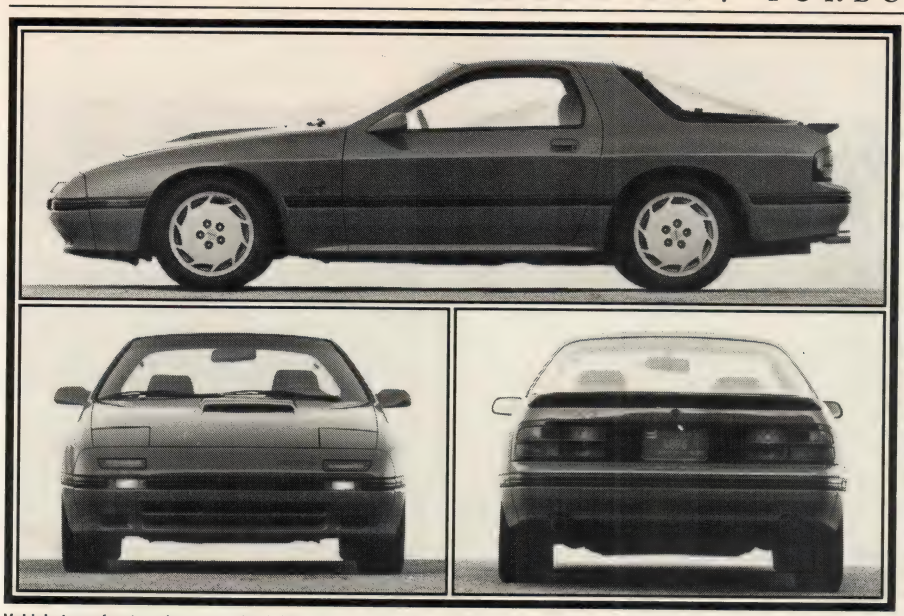
Set it on "E," for example, and the car smoothly and effortlessly changes gears to deliver optimal fuel economy.* Switch to "S," however, and instantly the car is transformed into its sport mode. Delaying upshifts to a very aggressive 5,500 rpm's, the range where maximum horsepower is generated. And there's a third setting, 3-2-1, that allows you to select a particular gear and stay in it.

Of course, the effectiveness of a transmission like this is ultimately dependent on the car it's linked to. Which just happens to be all BMW's 3.5-liter models, from BMW's fastest sedan, the 535i, to BMW's most luxurious sedan, the L7, shown here.

For a full demonstration, visit your nearby BMW dealer. Where you can experience what it's like to drive a car that instantly converts your mood into action without any loss in transmission. And where, at participating dealers, you'll find comprehensive leasing programs through the BMW Credit Corporation.

THE ULTIMATE DRIVING MACHINE.

*EPA-estimated 24 mpg, 30 highway. Fuel efficiency figures are for comparison only. Your actual mileage may vary depending on speed, weather and trip length. European Delivery can be arranged through your authorized U.S. BMW dealer.



Vehicle type: front-engine, rear-wheel-drive, 2-passenger, 3-door coupe

Price as tested: $19,500 (estimated)

Options on test car: none

Standard accessories: power steering, A/C, tilt steering, rear defroster

Sound system: AM/FM-stereo radio/cassette, 4 speakers

ENGINE

Type ..... turbocharged and intercooled 2-rotor Wankel, aluminum rotor housings, cast-iron end plates
Rotor radius x width x eccentricity ..... 8.27 x 3.15 x 1.18 in, 210.0 x 80.0 x 30mm
Displacement ..... 80 cu in, 1308cc
Compression ratio 8.5:1
Engine-control system ..... Mazda/Nippondenso electronic with port fuel injection
Emissions controls ..... 3-way catalytic converter, feedback fuel-air-ratio control, auxiliary air pump
Turbocharger ..... Hitachi HT18S-2S
Waste gate ..... integral
Maximum boost pressure ..... 6.2 psi
Valve gear ..... 2 side-intake and 1 peripheral exhaust port per chamber, rotor-controlled
Power (SAE net) ..... 182 bhp @ 6500 rpm
Torque (SAE net) ..... 183 lb-ft @ 3500 rpm

DRIVETRAIN

Transmission 5-speed
Final-drive ratio ..... 4.10:1, limited slip

Gear	Ratio	Mph/1000 rpm	Max. test speed
I	3.48	5.0	35 mph (7000 rpm)
II	2.02	8.6	60 mph (7000 rpm)
III	1.39	12.5	88 mph (7000 rpm)
IV	1.00	17.4	122 mph (7000 rpm)
V	0.76	22.9	145 mph (6350 rpm)

DIMENSIONS AND CAPACITIES

Wheelbase ..... 95.7 in
Track, F/R ..... 57.1/56.7 in
Length ..... 168.9 in
Width ..... 66.5 in
Height ..... 49.8 in
Curb weight ..... 2830 lb
Weight distribution, F/R 51.9/48.1%
Fuel capacity ..... 16.6 gal

CHASSIS/BODY

Type ..... unit construction with 1 rubber-isolated crossmember
Body material ..... welded steel stampings

INTERIOR

SAE volume, front seat ..... 49 cu ft
trunk space ..... 4 cu ft
Front seats ..... bucket
Seat adjustments ..... fore and aft, seatback angle
General comfort ..... poor fair good **excellent**
Fore-and-aft support ..... poor fair good **excellent**
Lateral support ..... poor fair good **excellent**

SUSPENSION

F: ..... ind, strut located by a control arm, coil springs, anti-roll bar
R: ..... ind, trailing arms with camber-control link and 1 diagonal link, articulated hub, coil springs, anti-roll bar

STEERING

Type ..... rack-and-pinion, power-assisted
Turns lock-to-lock 2.7
Turning circle curb-to-curb ..... 32.2 ft

BRAKES

F: ..... 10.9 x 0.9-in vented disc
R: ..... 10.7 x 0.8-in vented disc
Power assist ..... vacuum

WHEELS AND TIRES

Wheel size ..... 7.0 x 16 in
Tires ..... Goodyear Eagle VR55, 205/55VR-16
Test inflation pressures, F/R ..... 32/32 psi

CAR AND DRIVER TEST RESULTS

ACCELERATION Seconds

Zero to 30 mph 2.4
40 mph 3.6
50 mph 4.9
60 mph 6.5
70 mph 8.5
80 mph 10.8
90 mph 13.8
100 mph 17.6
Top-gear passing time, 30–50 mph 11.7
50–70 mph 9.8
Standing ¼-mile ..... 14.9 sec @ 94 mph
Top speed ..... 145 mph

BRAKING

70–0 mph @ impending lockup ..... 193 ft
Modulation ..... **poor** fair good excellent
Fade ..... **none** moderate heavy
Front-rear balance ..... **poor** fair good

HANDLING

Roadholding, 300-ft-dia skidpad ..... 0.84 g
Understeer ..... minimal **moderate** excessive

COAST-DOWN MEASUREMENTS

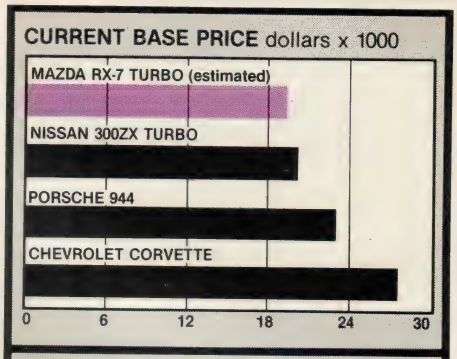
Road horsepower @ 30 mph ..... 4 hp
50 mph ..... 12 hp
70 mph ..... 25 hp

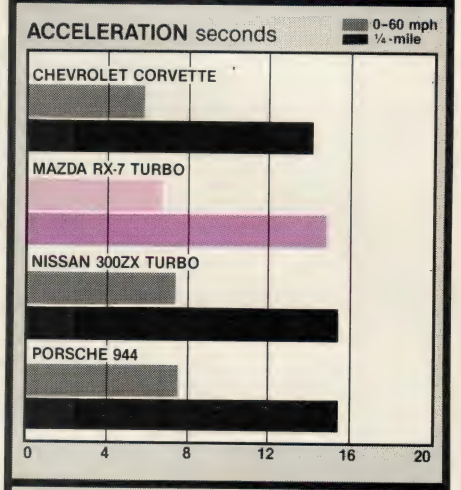
FUEL ECONOMY

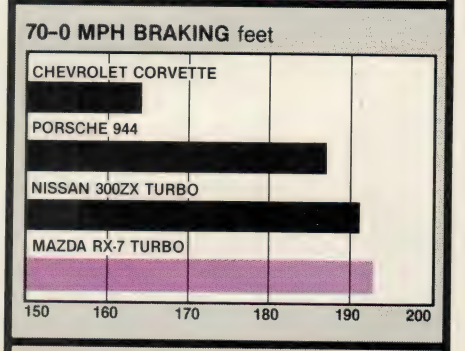
EPA city driving ..... **17 mpg**
EPA highway driving ..... 23 mpg
C/D observed fuel economy ..... **16 mpg**

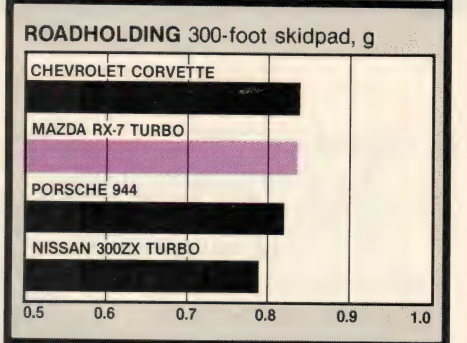
INTERIOR SOUND LEVEL

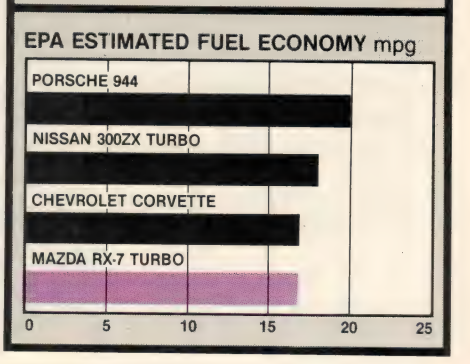
Idle ..... 49 dBA
Full-throttle acceleration ..... 84 dBA
70-mph cruising ..... 74 dBA
70-mph coasting ..... 73 dBA

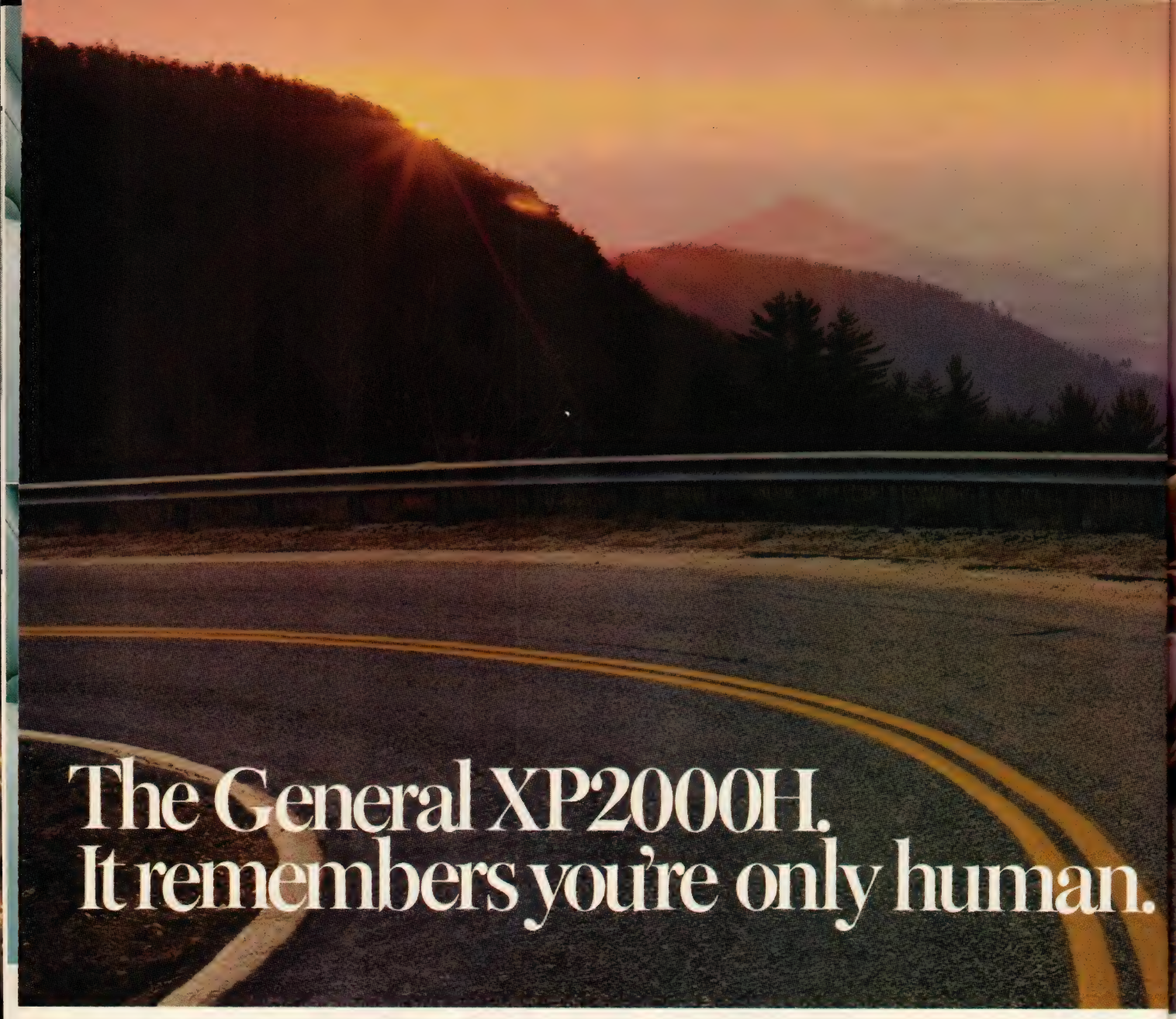












The General XP2000H. It remembers you're only human.

The XP2000H.®

A very understanding addition to the driving art.

Tested under the most demanding criteria, it combines H-block, computer-aided tread design with the cutting edge of radial construction technology. Designed to deliver confident control and unflustered performance.

BREEDING SHOWS.

Performance-tuned on test tracks, road courses and race circuits, the H-rated XP2000H responds like a thoroughbred.

Its behavior in the wet and dry is remarkably civilized.

Its blocky, water-shedding tread, High Speed Optimized (HSO) belt system and intelligent sidewall-over-tread engineering put it at the top of some pretty sophisticated shopping lists.

Matter of fact, the V-rated version of this beauty is now

original equipment on the new Saleen Mustang.

THE PROFESSIONAL CHOICE. If you're ready for a high-performance radial that's more than a match for the most demanding driving situations, you've got all the right reasons to get a set of General XP2000H high-performance radials. They come in your size, in classic white outline lettering or Euro-style blackwall.

And if you and your car require something other than H-rated capability, you can't go wrong with America's first T-rated radial, the XP2000,® or the outstanding new V-rated XP2000V.™ They're at your General Tire Motorsports dealer now.

GENERAL TIRE
MOTORSPORTS

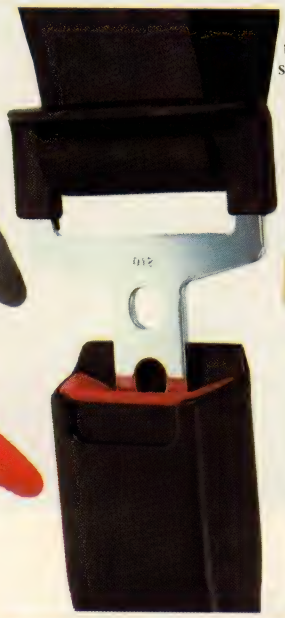
You need Generals.

IN AN ACCIDENT, COULD YOU SURVIVE YOUR CAR?

Does your car have front and rear energy absorbing crumple zones, like a Volvo?

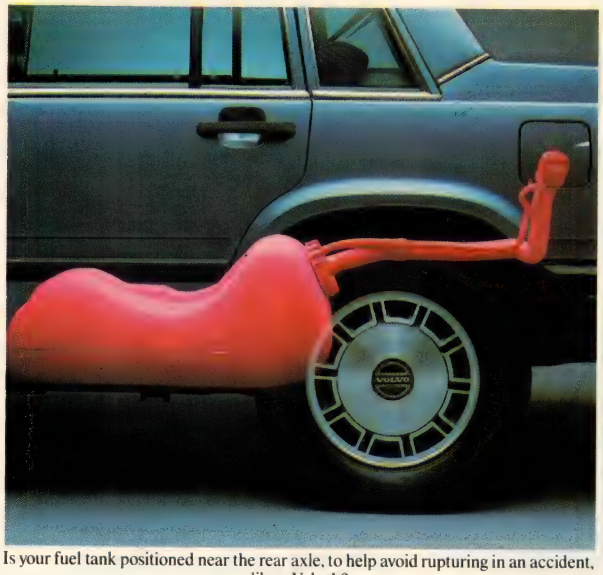
Does your car have bumpers that will withstand a 5 mph collision, like a Volvo's?

Is your steering wheel designed to automatically collapse then fold upwards to help cushion impact, like a Volvo's?

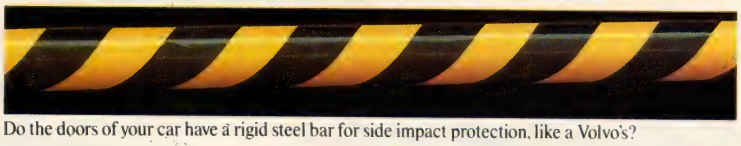


Is your car equipped with three-point belts in the rear seats, like a Volvo?

Does your car have a back-up braking system that provides 80% of the original stopping power, like a Volvo?



Is your fuel tank positioned near the rear axle, to help avoid rupturing in an accident, like a Volvo's?



Do the doors of your car have a rigid steel bar for side impact protection, like a Volvo's?

Is your car built around a steel safety cage to help protect the passengers, like a Volvo?

While no company can guarantee your safety in an accident, which would you rather be driving, your car or a Volvo?

VOLVO

A car you can believe in.

Jam Session

Thinking of fighting radar with radar? You'd better feel lucky, punk.

BY ARTHUR ST. ANTOINE

• You're loafing your Porsche along at 80 mph in the fast lane, enjoying the sparse traffic and the clear blue sky and the peaceful scenery, when suddenly your radar detector goes off like the Fourth of July. Without so much as a skip of your heart, you slide into the slow lane and ease back on the throttle. As you glide by the radar trap at 60 mph, Smokey's face is full of disbelief: he's just given a Porsche a healthy dose of his best instant-on, but his radar screen reads only 55. Nobody drives 55 in a *Porsche.* You see him frown, and in no time you're gone and back up to speed. You smile to yourself, sit back, and pat the little black box under your dashboard: the one with the number 55 glowing on its screen; the one that just jammed yet another police-radar unit . . .

Does this scenario sound inviting? Of course it does. Total immunity from the deadly rays of police radar is every enthusiast's dream. But does such a speeder's fantasy have any foothold in reality?

A small number of electronics companies and basement computer nerds seem to think so. The devices they make are said to have the ability to jam police radar by producing either false speed readings or no reading at all in Smokey's picture taker. Of course, anything this much fun is illegal (more on this later), so just finding the jammer makers as they play cloak and dagger with the law can be a trick in itself. From time to time, however, nearly all of them can be located through the classified pages of your favorite car magazine.

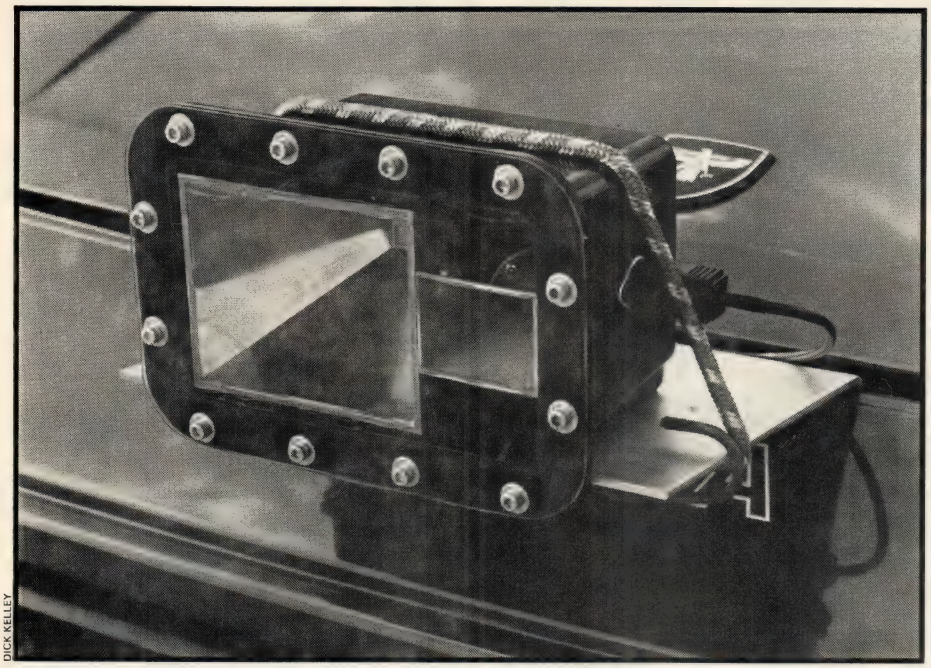
We at *C/D* read those classifieds, too, and our curiosity was aroused by the sudden abundance of electronic countermeasures being offered. Were the electrobrains on to something? Had the antidote to instant-on radar been found at last? Clearly, the speeding public had the right to know. Hearing duty's call, we geared up for a field test by gathering all the jammers we could get our hands on.

Before we jump into the nitty-gritty of jammer performance, you need to understand how police radar works and how jammers attempt to strip it of its sting. Smokey's radar works by taking advantage of the well-known Doppler effect—the same phenomenon that causes the pitch of a train whistle to change as the train rushes past a listener. The radar unit fires a precisely tuned microwave beam in the direction of the target vehicle, receives the reflection of that same beam, and measures the shift in frequency (the Doppler effect) between the transmitted and received signals. With a quick calculation, the radar unit converts the frequency shift into a speed on the operator's screen. In the blink of an eye, Smokey's got your number.

The jammer's mission is to confuse the radar unit when it searches for its returning signal. There are two basic approaches to this task, and hence two types of jammers. The first, which we'll call the scrambler type, is a radar source that emits so many beams of microwaves on or near a police radar's transmitting frequency that the radar cannot decide which of the signals it receives is the reflection of its own. Not sure which signal to trust, the radar screen goes blank. Since many varieties of environmental interference cause radars to go blank from time to time, the hapless radar operator suspects nothing.

The second and more sophisticated type of jammer, which we'll refer to as the

ILLUSTRATION BY LARRY TOPLE



DICK KELLEY

dial-in type, transmits a microwave beam at a specific frequency that corresponds to a bogus speed selected by the jammer user. Each mile per hour in speed correlates to an exact frequency shift (for you whiz kids out there, the figures are 31.4 hertz on the X-band radar frequency and 72 Hz on K-band), so all you have to do to produce a misleading reading on the radar operator's screen is transmit a strong signal that is made up of the appropriate number of microwave pulses per second. For example, when the driver of our 80-mph Porsche wishes to broadcast a 55-mph image to the police, his jammer transmits 1727 pulses per second (31.4 Hz x 55 mph) on X-band and 3960 pulses per second (72 Hz x 55 mph) on K-band. If his transmitting signal is strong enough, it will override the returning radar beam of the police unit and deliver the preselected speed to the radar screen. Sound intriguing? You bet! Does it work? That's what we intended to find out.

To spare any jammer maker the temptation of slipping us a ringer, we persuaded an independent organization to front for us and order the six jammers in this test. The same outfit did the necessary assembly work: one of the jammers arrived as a partially assembled kit, and one was not really a jammer at all but merely a set of plans and a parts list.

Once all six examples of the latest in counter-cop equipment were in our hands, we set out for the Chrysler proving grounds to separate the good from the bad. Two vehicles squared off for the testing: the role of Smokey was assigned to a Ford LTD outfitted in a plain-wrapper police package, and the Bandit's part was played by one of our favorite real-life perpetrators, our own Toyota MR2 long-term test car.

Since three of the jammers we tested are designed to use externally mounted transmitting antennas, we constructed an aluminum platform to support the bulky transmitter housings and mounted it at the front of the MR2. Bungee cords held each unit in place during testing, allowing quick and easy transmitter changes. Although this setup probably gave the jammers an advantage over a proper behind-the-grille or under-the-bumper mounting location, our main interests were to find out if the jammers worked at all and how they compared with one another.

In order to provide a wide range of police opposition, we gathered five widely used police-radar units to do battle with the jammers: a Decatur MV715 and an MPH Industries K55 represented X-band radar, and a Kustom HR-4, a Kustom HR-8, and a Kustom KR-10 were our K-band sources. For the testing, we lined up all five units on the dashboard of our LTD police car—creating a menacing row sure to strike terror into the heart of even the most jaded speeder.

Finally, we mounted our fifth wheel onto the MR2 target vehicle in order to provide accurate measurements of the ranges of effectiveness of both the jammers and the police-radar sources. The results are tabulated on page 111.

Each jammer was subjected to several runs against each radar unit to eliminate any possibility of a single lucky pass. We started each run well beyond the police radar's maximum effective distance, drove toward it at a steady velocity, and watched to see what appeared in its speed-display window. Since we had previously determined the maximum effective speed-measuring range of each radar unit, it was easy to see whether a jammer was reducing that range. For the dial-in units, we selected a 35-mph bogus speed; if the radar indicated 35 mph instead of the target vehicle's true speed, we had a jam. Finally, we tested each jammer statically by positioning it directly in front of each police unit in order to determine if it showed any hope of jamming at all.

Enough preliminaries. Without further ado, we present our unit-by-unit reviews of the six jammers, listed alphabetically:

AARON KILEY

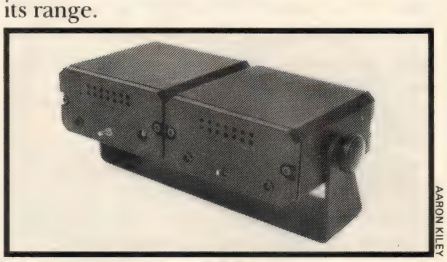
Envader

The Envader is a preassembled one-piece unit designed to scramble police-radar signals so that no reading appears in the radar unit's window. Slightly larger than an Escort radar detector, the Envader can be clipped to a visor or mounted on a dashboard. Power is supplied by a standard cigarette-lighter plug. The Envader's control panel offers an on/off switch, a test switch, a test meter, and a pilot lamp.

We found that the Envader, and the other scrambler units, were most effective at the outer reaches of the police-radar units' range. As the test car drew closer, the police radars were eventually able to distinguish their own signals from the "white noise" emitted by the scramblers. The scramblers could thus reduce the radar units' effective range but could not jam the cops' equipment entirely.

The Envader demonstrated some jamming ability against three of the five police units in our tests. It trimmed substantially the effective range of the HR-4 and HR-8 K-band units, and it cut the range of the Decatur X-band unit nearly in half. The Envader was completely ineffective, however, against the X-band K55 and the K-band KR-10.

At a purchase price of $345, the Envader buys you a little slowing-down time against some radar units, but the odds are still in Smokey's favor. And you can forget about using your radar detector when the Envader is broadcasting, because it produces a false alarm in every detector within its range.



AARON KILEY

Greenspan Super Jammer

Another scrambler-type unit is the Super Jammer from Greenspan Associates. Like the Envader, the Super Jammer ar-

DODGE DAYTONA TURBO Z
5/50 PROTECTION. STANDARD.

PURE ADRENALIN.

If you're ready for a rush, so is Dodge Daytona Turbo Z. At the tender age of three it has already mastered such tasks as leaping from zero to fifty in only 5.39 seconds. A very small number that translates into a rather big fact: Our Turbo Z beat Chevy's IROC Z.* Proof that beefy V-8s aren't the be-all and end-all to going in a straight line fast. With a bit of finesse you can fuel-inject and turbocharge half as many cylinders to do the job. But don't take our word for it, consult the street folk who write for *Car and Driver, Motor Trend, Road & Track,* et al. We're rather proud to say that they're rather impressed.

Of course, speed isn't the only rush to be had from the Turbo Z. The whole point of this machine's performance is *total* performance. And that means when the straight line turns into a curve, you've got front-wheel drive, nitrogen-charged shocks, and Goodyear Eagle GTs wrapped around 15-inch aluminum wheels to assist handling.

It also means an intelligent attention to ergonomics. Which simply means the Turbo Z fits like it was built around the driver—with deep buckets that include adjustable lumbar and thigh supports. With an integrated console that houses a 5-speed. With instrumentation that's glance-ready when you need to check the tach, turbo boost gauge, elapsed time indicator, gauge alerts, whatever. With a standard AM stereo/FM stereo that feeds your ears through six speakers. And with the great hands-on feel of a leather-wrapped steering wheel.

Outside, Turbo Z is just as ready for a rush. Air dam up front. Spoiler behind. And, if you choose, a T-roof in between.†

The long and short of it is this: Dodge Daytona Turbo Z is complete. And that includes Dodge's standard 5/50 Protection Plan.** Complete, because that's what *total* performance demands. If that's also what you demand, see your Dodge dealer about buying or leasing** a new Daytona Turbo Z. It's a shot of pure adrenalin.

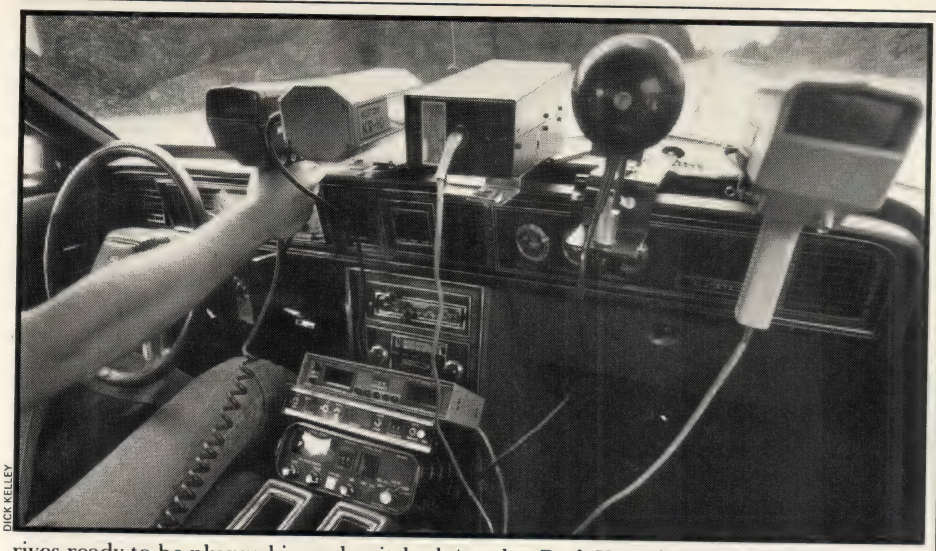
Dodge

DIVISION OF
CHRYSLER CORPORATION

AN AMERICAN REVOLUTION

**NHRA tests of standard 1986 models. **5 year or 50,000 mile limited warranty. Restrictions apply. Excludes leases. See copy at dealer. †Limited T-roof availability.*

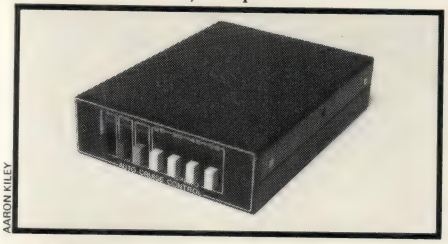
BUCKLE UP FOR SAFETY.


DICK KELLEY

rives ready to be plugged in and switched on. We tested a $349 dash-mount Greenspan; a remote-mount unit is available for $30 more.

The Super Jammer is relatively large and bulky and offers no provision for temporary installation. Its U-shaped mounting bracket doesn't even offer attachment holes. A good long strip of Velcro applied to the bottom of the bracket might support the Super Jammer, but it's still a lot of hardware to be perched on top of your dashboard.

Then again, you probably shouldn't worry much about mounting this device, because it failed to jam any of the radar units in our test. The police are going to nail you every time if you rely on a Super Jammer to scout your path.


AARON KILEY

Jam-It

With the Jam-It, a dial-in type of jammer, it is theoretically possible to punch in one of four preselected speeds (25, 35, 45, and 55 mph) and cause it to appear on the radar screen of the police unit. The Jam-It consists of two parts: a transmitter that is mounted under the bumper (although its housing is not weatherproof) and a control box that is mounted inside the car.

An interesting feature of the Jam-It is that its operation can be triggered by a radar detector; that is, it can be set up so that it transmits a jamming signal only after your detector has sniffed out a radar trap. This electronic link works so quickly that, at least in theory, such a setup should be effective even against instant-on radar.

At about $299, the Jam-It is the cheapest jammer in this test; however, our test unit was designed to work only against X-band radar. Both X- and K-band capabilities are offered in the newest devices from Jam-It, which also list for $299.

That's the end of the good news. Against our two X-band sources, the Jam-It was effective only against the K55, and only during our close-range static tests; it had no effect on the Decatur. For your money, you get an interesting unit to impress your friends, but virtually no protection from old Smokey.

AARON KILEY

Judge Pulsar

The Judge scrambler device looks like half of a Greenspan Super Jammer, sharing the same case and mounting-bracket designs. Its smaller size means that dash mounting should be less of a problem. Operating the Judge is simple: you plug it in and switch it on.

The Judge performed much like the Envader in our tests: it cut the effective range of the Decatur X-band by more than 75 percent, diminished the HR-8 K-band's effectiveness by more than a third, and also limited the HR-4 K-band's range. Also like the Envader, the Judge was worthless against the X-band K55 unit and the K-band KR-10 radar.

The $349 Judge may buy you some braking time, but you'd better hope you run into only the more easily tricked radar units. Even then, if you get too close to the source, you're going to get nailed. The Judge will also set off your radar detector. Maybe you'd be better off trying to buy a real judge.


DICK KELLEY

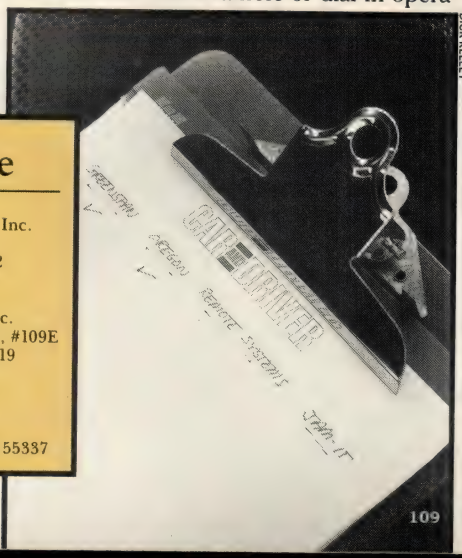
Oregon Microwave

Okay, do-it-yourselfers, this is your chance to get your hands dirty in the jamming game. Just make sure that you bring along a degree in electrical engineering.

Oregon Microwave is one of the boldest advertisers of jammers, showing a large picture of its device under the headline "Jam It!" Under the photo, its product is touted as the "best defense against instant-on radar."

For $54.95, Oregon Microwave will send you its plans, circuit boards, and a list of the parts necessary to construct its variation on the jammer theme. The instructions package could strike terror into the heart of even the most gifted electronics expert, so we were thankful that we had a capable laboratory to do the work for us. By the time our jammer was completed, our lab's investment in time and money included $125 worth of parts for the control box; $300 worth of hardware for the external X- and K-band transmitters; four hours of fabrication and assembly; and ten hours of troubleshooting with an oscilloscope, a digital voltmeter, and other professional equipment.

Once complete (whew!), the Oregon offers a choice of scramble or dial-in opera-



DICK KELLEY

Where the Jammers Are

Envader
Automotive Outfitters
96 West Old Country Road
Hicksville, New York 11801

Greenspan Super Jammer
Greenspan Associates
P.O. Box 741571
Houston, Texas 77274

Jam-It
Jam-It Corporation
P.O. Box 5519
Beaverton, Oregon 97006

Judge Pulsar
Midland Instruments, Inc.
P.O. Box 3052
Midland, Texas 79702

Oregon Microwave
Oregon Microwave, Inc.
9513 SW Barbur Blvd., #109E
Portland, Oregon 97219

Remote Systems
Remote Systems
13009 Glenview Drive
Burnsville, Minnesota 55337

Range of Effectiveness

POLICE RADAR SOURCE[1]	SCRAMBLE JAMMERS			DIAL-IN JAMMERS		
	ENVADER	GREENSPAN	JUDGE	JAM-IT	OREGON	REMOTE
DECATUR (1450′)	jams > 740′	no jam	jams > 325′	no jam	no jam	no jam
K55 (1590′)	no jam	no jam	no jam	no jam	jams < 380′	jams < 280′
HR-4 (930′)	jams > 680′	no jam	jams > 830′	NA[2]	no jam	jams < 200′
HR-8 (1650′)	jams > 1145′	no jam	jams > 1080′	NA[2]	no jam	no jam
KR-10 (1620′)	no jam	no jam	no jam	NA[2]	no jam	jams < 1100′

> = at distances greater than
< = at distances less than
[1]Number in parentheses is our measurement of the maximum effective range (in feet) of the radar source when no jammer interference was present.
[2]Jam-It was designed to operate on X-band only.

tion at the flick of a switch. Its control box is only slightly larger than a big radar detector, so under-dash mounting would not be difficult.

But why bother? First, we measured no effect whatsoever in the scramble mode. Second, though its dial-in speed was received by most of the police units during our static tests, the Oregon jammed only the K55 radar on the move, and only at close range. All in all, we'd call this device a $500 headache.

DICK KELLEY

Remote Systems

You've heard of this outfit before: its converted Escort tied for first place in our test of remote radar detectors (*C/D*, March 1985). The company also advertises something called the ECM 5446 Radar Speed Gun Calibration Unit. "ECM" stands for "electronic countermeasures," and the only intended speed calibration is on Smokey's radar gun.

You can buy this unit in many forms, from basic plans to fully assembled jammer; we opted for the ready-to-go unit. Transmitting antennas are not included, so our lab whipped up a set for us. The total cost of the setup amounted to a whopping $759—not including a housing for the antennas.

The Remote Systems jammer is a dial-in unit that is designed to work in cooperation with an Escort radar detector. It is almost exactly the same size as an Escort and is designed to sit atop one. The total package is fairly well integrated, though somewhat bulky on the dash. Unfortunately, dialing in a particular speed setting is nearly impossible. The rheostat-type control is so poorly marked that choosing any speed between the upper and lower limits (70 and 35 mph) is pure guesswork. You could easily err by 10 mph.

The Remote Systems unit foiled every one of our radar sources in our static tests, and it jammed three of them on the move. In two of these cases, however, the jamming occurred only at close range.

With more power, the Remote Systems jammer might be effective against radar at longer ranges, but for now all you get for your money is an expensive toy.

If the dreary performance figures we've brought to light haven't dimmed your view of jammers, let us once again remind you that using these devices is *illegal*. Sure, and so is speeding, you say. But be forewarned that if you get caught using a jammer against police radar, you could be in line for a $10,000 fine, or two years in the slammer, or both.

FCC spokesmen tell us that jammers are illegal as complete units, as kits, and even as plans. So how can all these companies openly sell jammers? So far, they have managed to skirt the law by offering their units as radio transmitters and by warning the buyer not to use his jammer near police-radar equipment. What the buyer does with his unit after the sale is up to him. The only problem is, you're supposed to have a license to use a radio transmitter, and you're not about to get one if the FCC finds out what sort of equipment you're playing with.

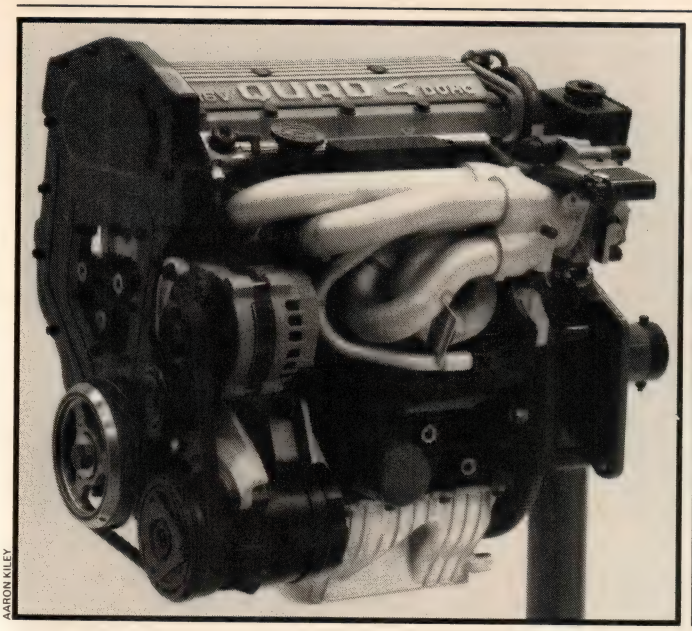
The FCC has been lenient so far because it knows that jammers are basically ineffective. Ironically, a jammer maker in Missouri was recently prohibited from doing further business because its jammers *didn't* work as claimed. Still, there is a growing amount of unnecessary airwave pollution out there, and the FCC says it is mounting a campaign to put a stop to all radar jammers soon.

When you consider their high price, their bulk, their lack of performance, and their illegality, you have to conclude that jammers just aren't worth the trouble at the present time. But hope springs eternal, and basement laboratories will no doubt continue their never-ending search for the better mousetrap.

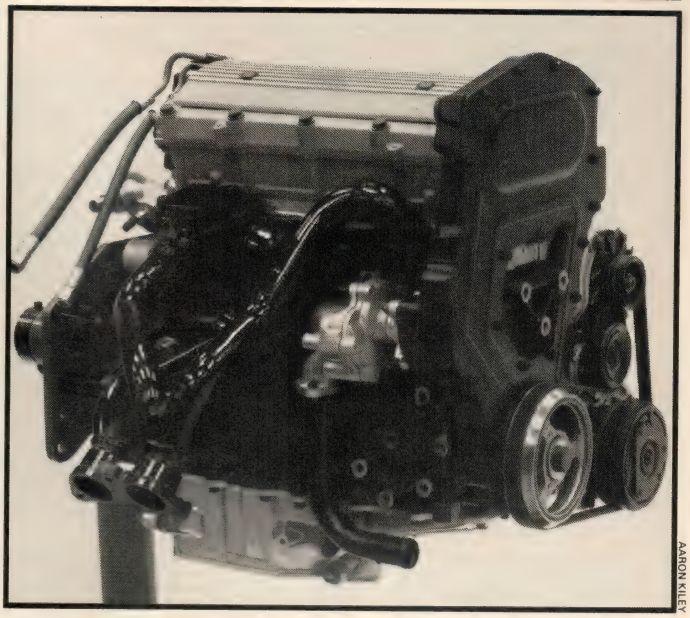
In fact, two new jammers came to our attention too late to be included in this test: an upgraded version of the Jam-It, with a new antenna system, and a unit called the Evadar, which is said to make cars invisible to the police without setting off radar detectors. We'll be sure to let you know if either of these jammers turns out to be worth mentioning.

For the moment, at least, the best course is to rely on the tried and true methods of playing the cops-versus-speeders game. Instead of jamming gizmos, we recommend that you stick with a reliable radar detector, a level head, quick reflexes, and a keen pair of eyes. ●

DICK KELLEY



AARON KILEY



AARON KILEY

Oldsmobile Quad 4 Engine

A 150-hp, four-cylinder, four-valve ticket to the front row of the engine builders' hall of fame.

BY CSABA CSERE

• Engines with four valves per cylinder are entering their golden age. Several top-rank performance cars now use such technology, which was once exclusive to racing engines, and more applications are planned. Unfortunately, none of these state-of-the-art powerplants is produced in America—at least not yet.

That's particularly sad because Chevrolet was the first automobile manufacturer in modern times to recognize the advantages of having more than two valves per cylinder in a regular-production engine. The Cosworth Vega of the mid-seventies was powered by a four-cylinder that boasted not only four valves per cylinder but also all-aluminum construction, double overhead camshafts, and electronic fuel injection—all features that are still impressive today. The development of the engine was botched, though, and the car never fulfilled its potential. When the Cosworth died with the rest of the unlamented Vega line, its engine sank without a ripple in the vast American sea of low-rpm, pushrod engineering.

Ever since, Detroit has seemed content to continue building its traditional slow-turning blunderbuss engines. The fuel-crisis days further supported the philosophy of limiting rpm in order to reduce friction. Low-rpm designs didn't require overhead cams, let alone multiple valves, according to Detroit's conventional wisdom.

Fortunately, a few shrewd engineers did understand that more efficient engines could provide both vastly improved power and worthwhile increases in fuel economy. Most of them were at work in Europe or Japan, and the fruits of their efforts are now in production.

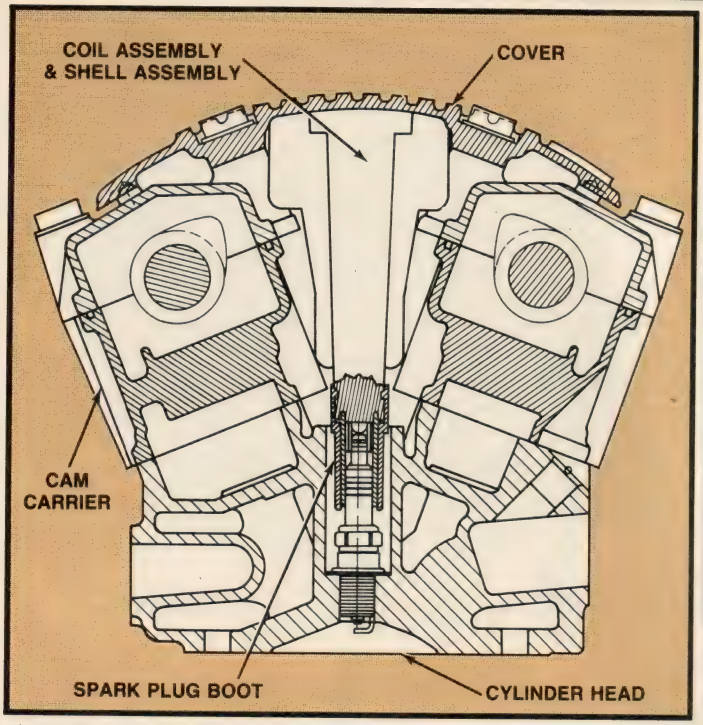
Some of them were also working behind the scenes at Oldsmobile. In 1982, Ted Louckes, the division's chief engineer, realized that the V-8 gas and diesel engines in production in Lansing, Michigan, were not going to survive General Motors' transformation into a front-wheel-drive car company. To protect Oldsmobile's engine-manufacturing interests, Louckes formed a team to design a new engine that would both be compatible with plans for future products and also incorporate the most sophisticated technology available.

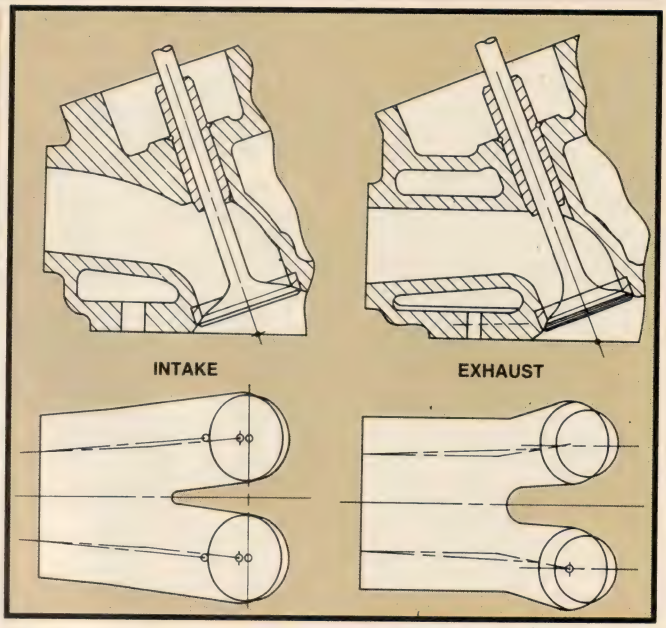
Louckes and the other key members of the Olds engine-design team—Tom Leonard, Rich Taylor, Marv Thomson, and Kelly Thurston—realized that an engine with high specific output and good thermal efficiency could have fewer cylinders, less displacement, higher efficiency, and even lower cost than a low-tech engine producing equivalent power. They selected a 2.3-liter in-line four with twin cams and four valves per cylinder as the ideal design to meet the power, economy, and packaging needs of the largest number of future GM automobiles.

Of course, planning is one thing, and receiving corporate approval for a major engine program is another—particularly for a division with limited small-displacement experience. What Oldsmobile needed to show GM management was that it had more than just a paper commitment to its proposed design, so it got its feet wet by building several running prototypes in 1983 and 1984. With hard data to help sell its concept, Oldsmobile won out over Chevrolet and received development approval in the fall of 1984.

Leonard and Thomson, in Oldsmobile's base-engine group, established several essential design goals for the new engine, dubbed the Quad 4. It would be new from the ground up, and it would combine the best combustion efficiency, friction characteristics, and volumetric efficiency possible, because excellence in these areas would benefit economy, power, and drivability. Their plan was to spend money to achieve these goals and then recover the costs by eliminating the usual add-on hardware. The engine would be designed with long-life durability and low maintenance built in. The Quad 4, in short, would represent a radically new set of attitudes for Detroit.

The heart of the Quad 4 is its cylinder head. The four-valve layout is conventional, with pent-roof combustion chambers and a 42-degree angle between the intake- and exhaust-valve stems. This configuration, combined with the engine's 3.62-inch bore, 3.35-inch stroke, and slightly dished





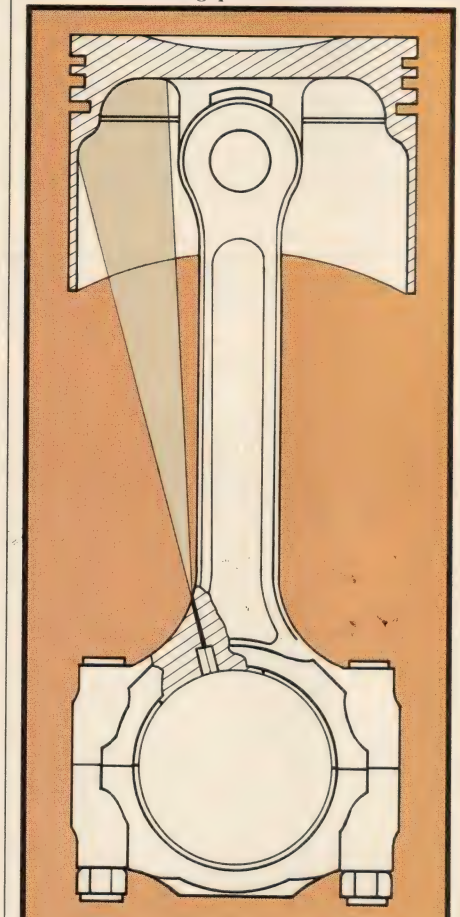
The Quad 4's cylinder head looks much like most other four-valve heads, but careful port development has resulted in outstanding breathing, along with enough swirl for fast, efficient combustion.

pistons, produces very compact chambers. The spark plugs are centrally located among the valves, and they have extended tips to place their gaps close to the geometric centers of the combustion chambers. A centrally located spark produces a short flame-front path, which makes for efficient and rapid combustion and a high resistance to detonation. As a result, the Quad 4's compression ratio has been set at a relatively high 9.5:1.

The Quad 4's valves are activated by two chain-driven overhead camshafts and hydraulic bucket tappets. Such tappets save money both in manufacturing and in service by eliminating the need for valve-lash adjustment. The chain drive is employed because even a double-width chain like the Quad 4's is narrower than a belt, resulting in a shorter engine, and length is a critical dimension in virtually all transverse-layout applications. Furthermore, chains are more durable than belts. In addition to the camshaft, the chain also drives the Quad 4's water pump (which is mounted alongside the block, again to help minimize engine length), so there will be no broken V-belt to cause this engine to overheat. Another feature aimed at improving durability is the positive valve rotaters on both the intake and the exhaust valves, which equalize seat wear.

The Quad 4's cylinder head consists of three major semipermanent-mold aluminum castings. The largest one incorporates the combustion chambers, the ports, and the cooling passages. Bolted to it are two cam carriers, which hold the camshafts and the bucket tappets; the cam carriers split on a plane through the camshaft center lines for easy assembly. Interestingly enough, the GM central foundry's lost-foam-casting techniques are not used in producing any of these aluminum parts.

The Quad 4's block is a computer-modeled thin-wall casting. Even the manufacturing process was computer-modeled to define machining procedures that would least distort the lightweight casting. Iron was chosen for the block, both for low cost and for durability. An aluminum block was considered, but Don Miles, the Buick-Oldsmobile-Cadillac Group assistant chief engineer who is currently in charge of the Quad 4, claims that the benefits of aluminum wouldn't justify its additional cost. He reasons that the Quad 4 is already lighter than the other engines used in its intended vehicles, and that there is little chance that any further engine-weight saving would be compounded by reductions in the cars' structures. Consequently, the overall benefits of saving a few more pounds by using a lightweight block would have been minimal.

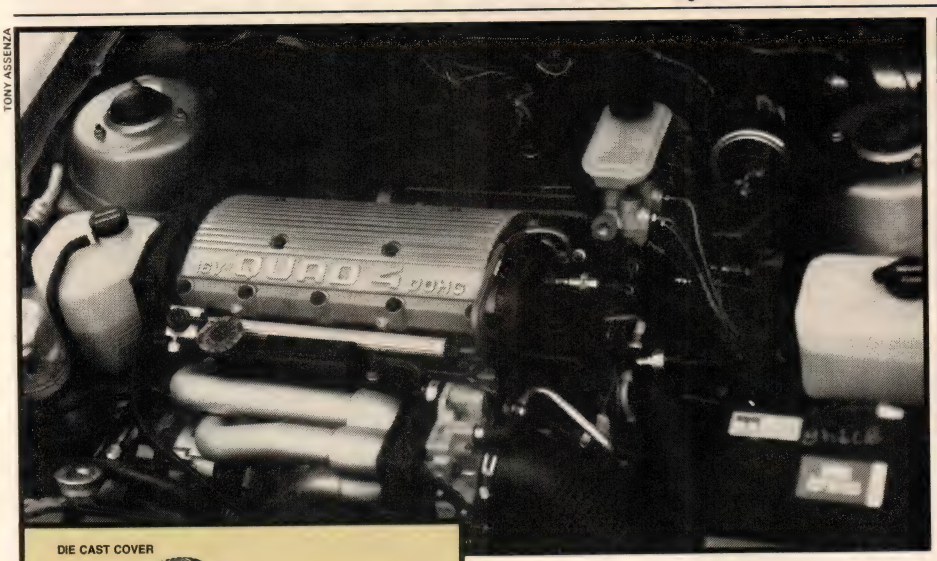


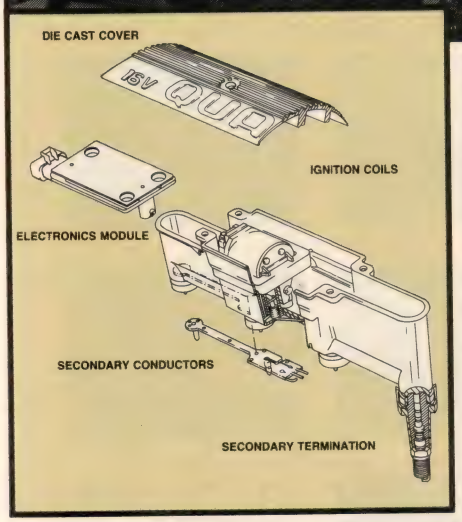
Jets in the Quad 4's connecting rods cool the underside of each piston with a spray of oil every engine revolution.

The engineers did, however, specify lightweight cast pistons (from an unnamed foreign source) in order to minimize the vertical shaking forces produced by the engine. And the forged-steel connecting rods that couple the pistons to a cast-steel, fully counterweighted crankshaft are also very light. Each connecting rod has a squirt hole that cools the underside of its piston with a jet of oil on every revolution. The engine's oil pump is located in the sump near the flywheel end of the pan and is gear-driven by the crankshaft.

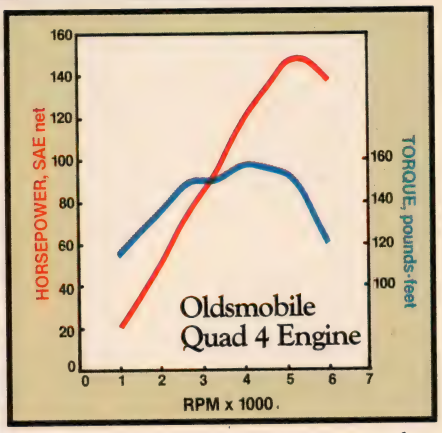
These basic engine details, though contemporary, are conventional; only in the Quad 4's ancillary components do we find anything unusual. For example, the intake manifold looks exactly like a four-into-one exhaust header with very short runners. This manifold, along with the intake duct between the throttle body and the air-cleaner housing, forms what Oldsmobile engineers call a three-degree-of-freedom, Helmholtz-resonator induction system. As the name suggests, the exotic manifold produces three tuning peaks in engine

TONY ASSENZA





The Quad 4's broad cam cover hides a distributorless ignition system. Two modules, each combining spark-plug connectors, a coil, and control electronics, serve two spark plugs.



breathing through the engine's speed range (see torque curve).

The regions between these peaks are bolstered by the Quad 4's four-two-one stainless-steel exhaust header. This header is on the back side of the engine as it's installed in a car. Such a location provides more flexibility in header design and reduces the distance between the header and the catalyst, allowing the catalyst to reach operational temperatures more quickly after a cold start.

The Quad 4 also has an unusual system called "direct-fire ignition." This design dispenses with a distributor, instead using two coils, one per pair of cylinders, to fire the spark plugs. Since each coil fires two cylinders simultaneously, a wasted spark is produced in each cylinder during its exhaust stroke. Each coil is integrated with the high-tension wiring and spark-plug connectors for its pair of cylinders, and the two coil assemblies fit neatly between the overhead camshafts. Oldsmobile engineers claim that this system produces higher, more consistent voltage and a shorter rise time than conventional ignition systems. A GM engine-control computer uses crankshaft-position sensors, a knock sensor, and a manifold-pressure sensor to regulate ignition timing.

The same computer also controls the Quad 4's port fuel injection. The system uses no airflow sensor; instead, a microprocessor calculates the airflow from inputs on engine rpm, on intake-manifold pressure and temperature, and from an empirically determined volumetric-efficiency table.

In all aspects of the Quad 4's detail design, the engine team took advantage of extensive research and competitive-engine data provided by GM's research staff. Friction, for example, was reduced with the use of low-tension piston rings and minimally sized bearings. Overall friction is claimed to be about one-third lower in the new engine than in GM's well-massaged 2.5-liter four-in-line. Oldsmobile also claims that the Quad 4's intake- and exhaust-port efficiency, heat rejection, and specific fuel consumption are as good as can be found in any engine in the world.

Interestingly enough, despite all the competitive research and world-class claims, the Quad 4 has very few gimmicky features—no variable-intake systems, no swirl ports or shrouded valves, not even exhaust-gas recirculation or air injection for emissions control. All of these systems were evaluated in the engine's design phase, but none promised to be of sufficient benefit to justify its complication and cost, according to Oldsmobile.

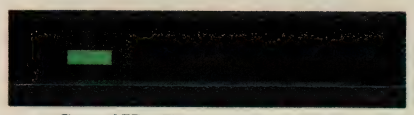
The Quad 4's preliminary performance figures provide strong support for Oldsmobile's impressive claims. In its current stage of development, the 2.3-liter produces 150 horsepower at 5200 rpm and 160 pounds-feet of torque at 4000 rpm. At 66 hp per liter, the Oldsmobile's specific output beats every other normally aspirated American engine and some imported four-valvers. The Quad 4 shines even brighter in specific torque, where its 71 pounds-feet per liter is the best we've seen in any American-specification engine.

Engineers also compare engines by looking at a figure called brake mean effective pressure (BMEP), which indicates the theoretical average usable pressure applied to the pistons during their power strokes. The Quad 4's BMEP is 175 psi at the torque peak (which is always the point of maximum BMEP) and 166 psi at the power peak. Both of these figures are higher than those for any other normally aspirated engine in the American market, and the closeness of their magnitudes demonstrates the flatness of the Quad 4's torque curve. These figures also suggest that the Quad 4 could produce far more power if it

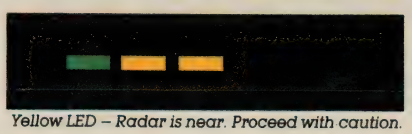
Four-Valve Engines

	Oldsmobile 2.3-liter 4-in-line	Honda 2.5-liter V-6	Mercedes 2.3-liter 4-in-line	Saab 2.0-liter 4-in-line	Toyota 2.0-liter 4-in-line
bore x stroke, mm	92.0 x 85.0	84.0 x 75.0	95.5 x 80.3	90.0 x 78.0	86.0 x 86.0
displacement, cu in/cc	138/2260	152/2494	140/2299	121/1985	122/1998
compression ratio	9.5:1	9.0:1	9.7:1	10.0:1	9.2:1
horsepower, SAE net	150 @ 5200 rpm	151 @ 5800 rpm	167 @ 5800 rpm	125 @ 5500 rpm	135 @ 6000 rpm
torque, lb-ft, SAE net	160 @ 4000 rpm	154 @ 4500 rpm	162 @ 4750 rpm	123 @ 3000 rpm	125 @ 4800 rpm
specific power, hp/liter	66.4	60.6	72.6	63.0	67.6
specific torque, lb-ft/liter	70.8	61.8	70.5	62.0	62.6
BMEP @ power peak, psi	166	135	163	149	146
BMEP @ torque peak, psi	175	153	174	153	155

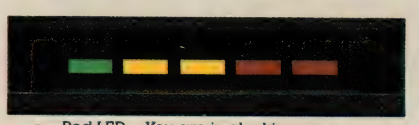
SEE RADAR IN A NEW LIGHT.



Green LED – There's radar in the area.



Yellow LED – Radar is near. Proceed with caution.



Red LED – You are in clocking range.

FOX TAKES RADAR OUT OF THE DARK WITH THE SUPERFOX VIXEN II.

Now you can see much more than red when you look at a radar detector.

When you look at the Vixen II LED, you'll see just how close you really are to radar.

Green tells you there's radar in the area.

Yellow warns you that you are much closer and should proceed with caution.

And red is the range that's accompanied by one continuous audio alarm.

It combines both sight and sound into the most advanced alert system in radar today. No tiny numbered meters to read. No bouncing needles. No more guessing.

WHAT ROAD & TRACK SAW, IT "HIGHLY RECOMMENDED."

ROAD & TRACK Magazine's April '85 issue looked at the 10 most widely distributed radar detectors. They tested for overall Sensitivity, Sensitivity Around A Corner, Sensitivity Cresting A Hill, the Maximum Audible signal, and Leakage and Leakage Reception (picking up non-radar signals as radar). It was a tough road test that not everyone passed and that only a few were considered good enough to be "highly recommended" by the editors of ROAD & TRACK.

The SuperFox Vixen II was one of the few.

WE'RE AS SENSITIVE TO RADAR AS YOU ARE.

Fox has been pioneering the research and development of radar detectors for almost a decade. The Vixen II incorporates the most advanced technology in radar today, both in finding radar and in communicating its findings to the driver.

A dual conversion superheterodyne receiver gives the Vixen II many times the range of any radar signal. No matter what the band, pulse or continuous. What's more, the Vixen II goes beyond line of sight range. It can see around corners and over hills to pick out weak reflected signals.

CITY, HIGHWAY, OR PRESET.

The Vixen II is sensitive to all your driving needs. So we offer you a choice of City/Highway or Preset.

For most driving, a special "Preset" position will yield the best results. Around town, you may want to turn the squelch control to "City," to eliminate annoying false alarms from non-microwave signals, for example.

On the open road, turn it to "Highway." Or choose any point in-between. With the Vixen II, you're in control.

IT'S LIGHT ON VISORS, TOO.

Our sensitivity even extends to installation. The mounting system of the Vixen II adapts to any size or shape dash. Or if you prefer, clips quickly to any visor.

When you reach your destination, you can simply unplug the cord and put your Vixen II safely away.

A VIXEN II IS AS NEAR AS YOUR PHONE.

With Fox, it's easy to get your hands on a radar detector before you buy. Call for the name of the Fox dealer nearest you. Call toll-free, 1-800-543-7892. In Ohio, 1-800-621-2513. And in Canada, 1-800-663-0295.

FOX

FOX MARKETING, INC.

Fox radar detectors are legal in all states except Connecticut and Virginia.

were tuned for higher rpm. Sure enough, Don Miles admits that a 180-hp version has already been built.

In addition to its excellent power potential, the Quad 4 also promises commendable fuel economy. According to preliminary tests, it produces about fifteen percent better fuel economy than Pontiac's 2.5-liter four and over 30 percent better economy than Buick's 3.0-liter V-6—and in acceleration performance it is superior to both.

Oldsmobile also claims that the Quad 4's lightweight internal components and oversquare design produce minimal shaking forces, barely more than a 1.8-liter Honda engine. That seemed incredible to us until we drove a Calais fitted with a Quad 4 prototype. In this application, the engine felt refined, quiet at normal rpm, and smooth all the way to its 6800-rpm redline, though it did get boisterous at high rpm. The Quad 4 has been designed to accept balance shafts for luxury-car applications, but even without them we found its characteristics very satisfying.

Oldsmobile's claims for the Quad 4's output are also quite believable. The five-speed Calais prototype we drove felt much quicker than the V-6–powered versions we've driven. It pulled strongly to 7000 rpm in the lower gears, yet accepted full throttle at 1000 rpm in fifth without protest. All in all, the Oldsmobile Quad 4 is a jewel of an engine.

Unfortunately, you won't be seeing any Quad 4s at your Oldsmobile dealership for some time. Initial low-volume production is scheduled for a special Calais model due halfway through the 1987 model year. Full production won't begin until 1988, when the engine will also be offered in Pontiac's Grand Am and Buick's Somerset Regal. Eventually it will find its way into various other front-drive intermediates and a few other GM cars; with a planned production capacity of 3200 engines per day at the B-O-C Group's Delta plant in Lansing, Michigan, there should be plenty of Quad 4s to go around. Of course, interdivisional politics will also be a factor in the application decisions. Our suggestion that the Quad 4 would make an ideal powerplant for Pontiac's Fiero was coolly dismissed by Oldsmobile representatives.

Nevertheless, the Quad 4 is good news indeed for American car enthusiasts. It has the potential of delivering first-class engine technology to the masses. The initial version of the engine, impressive as it is, barely scratches the surface of its potential. The engineers are already talking about a 250-hp, turbocharged version.

Most important, the Quad 4 signifies a shift in Detroit's engineering philosophy. By showing what can happen when engineers decide to abandon the cheap-think, innovation-avoiding, build-it-no-better-than-it-has-to-be approach, the Quad 4 bodes well for all American cars. ●

Buick Regal Grand National

Speed is a gunslinger in black.

• Corvette, get outa town. Mustang, move over. Camaro, keep your back to the wall at all times. The biggest, baddest gun west of the Pecos is loose in the streets, and there's gonna be some shootin'.

That's right, friends, we're talking about the Buick Regal Grand National—the same basic car you've seen tooling around since 1978. In the past, we've given this model a nod of respect for its muscular turbocharged 3.8-liter V-6 engine and gone on our way. But something happened this year. For 1986, the engineers went over the Grand National with a fine-toothed comb, and it's now ready to take on all comers in the world of high-performance automobiles—the bigger the reputation, the better.

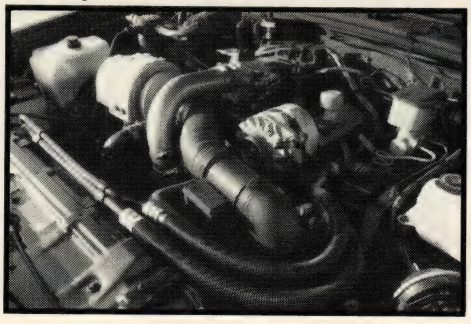
Okay, no more beating around the bush. The hulking black Grand National pictured here will scream from 0 to 60 mph faster than any other car made in America. Is 4.9 seconds fast enough? It is if you want something quicker than a Lamborghini Countach (5.1 seconds), a Chevrolet Corvette (5.7 seconds), a Porsche 928S (5.7 seconds), a 944 Turbo (6.0 seconds), and the hottest Mustang or Camaro. The GN even outsprints two of Ferrari's blue bloods—the Testarossa (5.0 seconds) and the GTO (5.1 seconds)—both of which we tested in European specification.

As a matter of fact, there is only one production-line automobile for sale in the U.S. that will beat the flash from Flint in the 0-to-60 dash: the $50,000 Porsche 911 Turbo, which accomplishes the feat in only 4.6 seconds.

The Grand National also inflicts cruel and unusual punishment on asphalt in the quarter-mile, its 13.9-second ET spotting it a tick ahead of most of the hot cars sold in America. Unfortunately, the Regal is a blunt instrument, and its poor aerodynamics hold its trap speed to 98 mph; by the end of the quarter, the Ferraris and some of the Porsches are moving faster. But let's not quibble. The Regal is a shining star in the high-performance cosmos.

The Grand National's Olympian speed is one of the 1986 model year's biggest surprises, because little about this car appears to have changed. From the outside, your only clues are the small badges on the front fenders that say "Intercooled." Under the hood, the only noticeable revision is the addition of an air-to-air intercooler. Located aft of the radiator, it lives beneath a plastic shroud and breathes cool air from under the car.

The Buick engine engineers will tell you that this intercooling project was the last treat thrown their way by former assistant chief engineer Don Runkle before he left to become Chevrolet's chief engineer. The goal set for the small band of tuners was clear and true: make the Grand National more powerful than the Corvette. According to the advertised figures, the 235-hp Buick has won the interdivisional feud by 5 hp. That makes it GM's most powerful passenger car.



Getting there took more work than meets the eye. The extra plumbing required to route the intake air through the charge cooler created more boost lag—which is always undesirable—and a number of revisions were necessary to counteract the problem. The turbo was repositioned to the front of the V-6's right exhaust manifold in order to shorten the exhaust plumbing. A low-inertia turbine wheel helps the blower spin up to full boost more quickly. The compressor side of the turbo is larger now, though maximum boost remains at 14 psi—no small amount. Exhaust back pressure was reduced significantly with a Corvette-type wide-mouth catalytic converter. Finally, a stouter set of cast pistons was specified because of the engine's higher internal stresses.

So much for the cold, hard facts. Now for the intrigue: the big Buick's performance simply does not compute. The Corvette, for instance, is nearly 300 pounds lighter, wears much larger tires (255 versus 215), has proportionally more weight on its rear wheels, is wrapped in an aerodynamically cleaner body, and develops only 5 hp less than the Grand National. Nevertheless, the Regal cleans its clock. Something smells foul in the fish factory.

And something is. Faced with these out-of-kilter performance stats, the *C/D* tech team calculated that our test car was actually producing something in the neighborhood of 290 horsepower. When ques-

PHOTOGRAPHY BY AARON KILEY

tioned, Buick insiders admitted that the intercooled V-6 turbo was intentionally rated "ten to fifteen horsepower low."

Part two of the puzzle is atmospheric conditions. We tested on a brutally cold day—eight degrees Fahrenheit—which we calculated had improved the engine output by another 15 hp. That brings the total to about 265. As near as we could tell, our test car had not been tinkered with. So where did the 25 extra horses come from? Write us if you know.

Mathematics aside, what's important about this Regal is the kick you get from having such a deep well of power at your disposal; the way the world gets yanked backward when the boost boils over; the way the rear tires lay down long, beautiful streaks of black when you tromp the throttle.

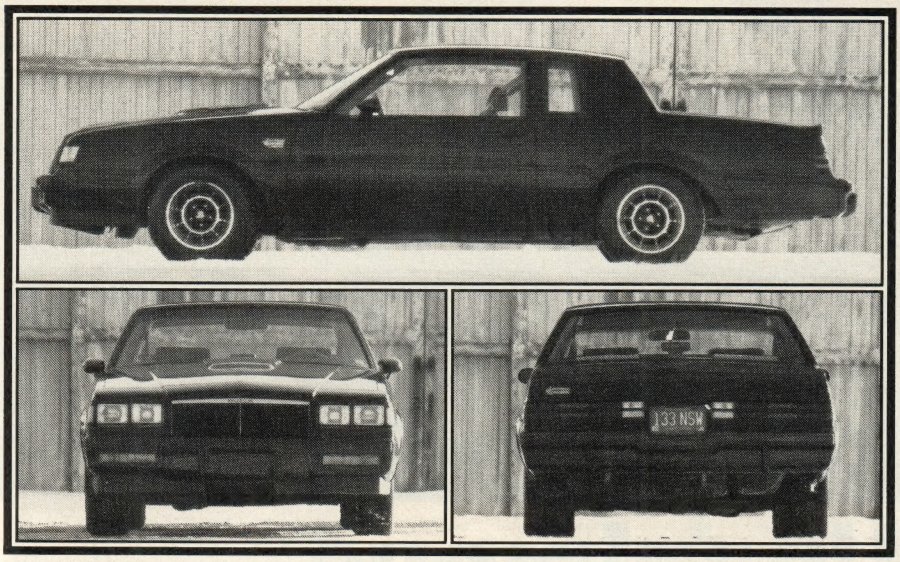
The Grand National is also a pretty slick all-around device. Sure, it looks as if it just rolled out of a Burt Reynolds movie: it's big and broad-shouldered and macho in a self-conscious sort of way. Yes, there's too much razzmatazz in the gray, black, and chrome interior for Eurosedan fans. But, hey, this is a red-blooded American—it was named for a *stock car*, after all—and it drives well enough to tug at your patriotism.

In traffic, the Grand National purrs and burbles, and it's as docile as any grocery getter. The Turbo Hydra-matic four-speed automatic is always ready with the right gear. It's only during top-speed maneuvers that you uncover the drivetrain's one flaw: an electronic governor shuts the engine down at 124 mph, about 10 mph before the GN would otherwise reach its speed limit. The limiter is on duty because the hottest American-made car lacks high-speed V-rated rubber. Except for this built-in handicap, the Grand National is good to the last drop.

There are other nice things to say about life with Grand National. This time around, there's actually some poetry in the chassis. The steering is crisp, the lane discipline good, and the ride well balanced. The most serious of car guys will find nothing to sneer at here.

That's why the Regal Grand National has earned a warm place in our editorial hearts. Here is a car with enough firepower to clean up the town; a car that says "anytime, anywhere"; an American purebred for which no excuses need be made. You've got to respect that kind of grit.

—*Rich Ceppos*



Vehicle type: front-engine, rear-wheel-drive, 5-passenger, 2-door sedan

Price as tested: $17,031

Options on test car: base Buick Regal T Type, $13,714; Grand National package, $635; sound system, $589; 6-way power driver's seat, $225; power windows, $195; cruise control, $175; rear defroster, $145; power door locks, $130; other options, $809; freight, $414

Standard accessories: power steering, A/C

Sound system: Delco/GM AM/FM-stereo radio/cassette with graphic equalizer, 4 speakers

ENGINE

Type	turbocharged and intercooled V-6, iron block and heads
Bore x stroke	3.80 x 3.40 in, 96.5 x 86.4mm
Displacement	231 cu in, 3791cc
Compression ratio	8.0:1
Engine-control system	GM-Buick with port fuel injection
Emissions controls	3-way catalytic converter, feedback fuel-air-ratio control, EGR
Turbocharger	AiResearch TB0348
Waste gate	integral
Maximum boost pressure	14.0 psi
Valve gear	pushrods, hydraulic lifters
Power (SAE net)	235 bhp @ 4400 rpm
Torque (SAE net)	330 lb-ft @ 2800 rpm

DRIVETRAIN

Transmission	4-speed automatic with lockup torque converter
Final-drive ratio	3.42:1, limited slip

Gear	Ratio	Mph/1000 rpm	Max. test speed
I	2.74	8.0	40 mph (5000 rpm)
II	1.57	13.9	70 mph (5000 rpm)
III	1.00	21.8	109 mph (5000 rpm)
IV	0.67	32.6	124 mph (3800 rpm)

DIMENSIONS AND CAPACITIES

Wheelbase	108.1 in
Track, F/R	58.5/57.7 in
Length	200.6 in
Width	71.6 in
Height	54.6 in
Curb weight	3520 lb
Weight distribution, F/R	55.1/44.9%
Fuel capacity	18.1 gal

CHASSIS/BODY

Type	full-length frame with rubber-isolated body
Body material	welded steel stampings

INTERIOR

SAE volume, front seat	53 cu ft
rear seat	45 cu ft
trunk space	16 cu ft
Front seats	bucket
Seat adjustments	fore and aft, seatback angle, front height, rear height
General comfort	poor fair **good** excellent
Fore-and-aft support	poor fair **good** excellent
Lateral support	poor **fair** good excellent

SUSPENSION

F:	ind, unequal-length control arms, coil springs, anti-roll bar
R:	ind, rigid axle, 4 trailing links, coil springs, anti-roll bar

STEERING

Type	recirculating ball, power-assisted
Turns lock-to-lock	2.8
Turning circle curb-to-curb	38.9 ft

BRAKES

F:	10.5 x 1.0-in vented disc
R:	9.5 x 2.0-in cast-iron drum
Power assist	vacuum

WHEELS AND TIRES

Wheel size	7.0 x 15 in
Wheel type	cast aluminum
Tires	Goodyear Eagle GT, P215/65R-15
Test inflation pressures, F/R	35/35 psi

CAR AND DRIVER TEST RESULTS

ACCELERATION

	Seconds
Zero to 30 mph	1.8
40 mph	2.7
50 mph	3.7
60 mph	4.9
70 mph	6.6
80 mph	8.9
90 mph	11.4
100 mph	14.4
110 mph	21.8
120 mph	33.1
Top-gear passing time, 30–50 mph	3.0
50–70 mph	4.0
Standing ¼-mile	13.9 sec @ 98 mph
Top speed	124 mph

BRAKING

70–0 mph @ impending lockup	197 ft
Modulation	poor **fair** good excellent
Fade	none moderate **heavy**
Front-rear balance	poor fair **good**

HANDLING

Roadholding, 300-ft-dia skidpad	0.80 g
Understeer	minimal **moderate** excessive

COAST-DOWN MEASUREMENTS

Road horsepower @ 30 mph	7 hp
50 mph	17 hp
70 mph	36 hp

FUEL ECONOMY

EPA city driving	**17 mpg**
EPA highway driving	24 mpg
C/D observed fuel economy	**13 mpg**

INTERIOR SOUND LEVEL

Idle	50 dBA
Full-throttle acceleration	73 dBA
70-mph cruising	71 dBA
70-mph coasting	70 dBA

PATRICK BEDARD

Seeing red.

• Something is going around the car world these days, much the way sniffles go around kindergarten. BMW seems to be the culprit. It came down with a case of the red instrument lights on its 5-series cars back in 1972 and started an epidemic. Now everybody is catching it. Audi has all the symptoms. Pontiac has got it bad. And I'm worried about Chrysler.

If some enemy wanted to torture me, it wouldn't have to shove bamboo slivers under my fingernails or attach electrodes to my tender parts. Red instrument lights would be enough.

"No, please, not the red instrument lights! Can't you just keep on with the tarantulas and the white-hot poker?"

I can't explain why red gauges are such a jolt to my sensibilities. They just are, and I've always hated 'em.

That's on the subjective level. On the objective level, they're hard to read. The typical setup has white markings on a black background, and in the daytime it's beautifully clear. For night illumination, it's flooded in red light. Instant murk. The now-red numbers frequently grow halos of optical fuzz around themselves. Sometimes they seem to vibrate. I end up dialing brightness to the max and muttering under my breath about the perversity of dashboard designers.

I would have called long ago for a congressional investigation or something, except I always assumed that the murk must be some peculiarity of my eyes.

Then I discovered the Standard Observer Curve. This is an industry standard that was established in 1931 by the Commission Internationale de l'Eclairage. It describes how the eye of a hypothetical "standard observer" responds to light of various wavelengths. And what it says, in a nut hull, is that humans can't see red.

Imagine a slightly lumpy bell curve spread across the spectrum of visible light. Visual acuity peaks in the middle at greenish yellow, and it drops on both sides. Red is at the long-wavelength end of the spectrum. And, of course, there are various shades of red—from dark red, at the hard-to-see end, to orange-red, which is higher on the curve. But "red" light of the same radiant power as greenish yellow produces only about twenty percent as much visual response in the eye.

That means I'm not peculiar after all (well, at least not my eyes). *Nobody* can see red! Those car-designing bastards.

BMW is to blame; that's clear to me. All the others are just trying to cash in on BMW's "ultimate driving machine" image. Not, mind you, that we should forgive them their irksome trespasses simply because they are unimaginative followers rather than leaders.

BMW, however, is clearly the perpetrator, and BMW, it seems to me, owes the drivers of this world a few answers. So, in a burst of investigative journalism, I called BMW and asked why the red lights. The spokesman must have been waiting for me, because the answer was starting before the question was stopped. "That's for night vision," he said. "Fighter planes and bombers are that way. The red doesn't hurt your night vision."

I've heard this excuse a dozen times. "What planes?"

He didn't know, but he was sure military airplanes use red lighting on their instruments.

Had BMW ever put this in writing? Sure, and he promised to send volumes. But a search didn't turn up any claim stronger than "optically beneficial," and a statement that BMW instrument lighting was "identical to that used on aircraft."

Hmmmmm, this sounded like a job for the air force. But when you find someone in the USAF close enough to the truth to give an unequivocal answer, he won't talk on the record unless you make big promises. So this conversation is not for attribution.

"Is it true that military aircraft use red instrument lighting because it doesn't hurt night vision?"

"Used to be, up until the late sixties. But along with not hurting night vision, people can't see red very well, so they turn up the brightness. And when they get the brightness up, the value of the color is negated. So we've gotten away from it now."

He went on to say that night vision depends upon a vitamin-A-derived chemical in the eyes called rhodopsin. It rebuilds slowly after an exposure to bright light; four or five minutes gets most of it back, but good night adaptation takes about half an hour. Because of oncoming headlights, he said, red lighting doesn't make much technical sense in a car.

Red lighting apparently doesn't make much technical sense in airplanes, either. Certain air-force planes—the KC-135, for example—are now being retrofitted with white lights.

So what's the deal with cars? Are we talking a textbook case of monkey-see, monkey-do design (this was my bet), or do the carmakers have reasons not obvious to us lesser beings?

Pontiac has red lighting in all of what it calls its "image car lines"—including the Firebird, the Sunbird, the Grand Am, and the 6000—except the STE, which has electronic bar graphs. The Pontiac engineer in charge of instrument panels was sure that all his lighting setups pass visibility tests, but added that the work is done in the AC Spark Plug Division, where the clusters are made. As far as he knew, there isn't much science behind the color choice. "Probably Bill Scott looked at a BMW or something and said, boy, we could really theme around that red color."

Aha! Closing in on the villain. No, make that arch villain, because Bill Scott is the head of Pontiac's interior-design studio. Actually, he's a thoroughly earnest and charming guy, but (heh, heh) that doesn't exempt him from hard questions.

"Obviously, it does something for us in a distinctive cluster look when there were very few cars on the market with red lighting," he said. "So that's one big reason why we did it.

"You know, you could wear your pants on your head and look different too," he went on. "But we think red is a good appearance. It's in good taste. People ooh and ahh when they see it.

"I know there's some controversy [about visibility]. We've been through all those scenarios, so I'm telling you this with some hesitation: I believe in [red lighting]. We're trying very hard at Pontiac to do purposeful kinds of things. We make mistakes, which you guys are quick to point up, but we're working hard to fix them."

Bingo. We've got him now. Up against the wall, red-light mutha. Red is a fashion statement, Scott was saying, just as I had suspected all along. But instead of exulting at this admission, I actually began to feel sorry for him. If ever a guy was trapped by the market, it's Scott. He has to design cars that people will buy. And people don't buy the best science; they buy what they think is neat.

Admit it. How many of you like the red lighting? How many of you out there think it's the high-techest thing since the digital wristwatch, and can't wait to get a new car with the speedo glowing up at you like a neon pizza? I now know whom to blame for this assault on the eyeballs, dear reader, and it's you. •

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